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CONTRIBUTION TO THE RESEARCH ON
FUNGUS FLORA IN SUNFLOWER SEED

Sunflower seed, as well as the seed of the majority of cultured plants, is a favourable substratum for the development of numerous micro-organisms. The sowing and commercial qualities of sunflower seed depend on the species and the number of micro-organisms on the surface of or in the seeds. A large number of fungus species attack the seed in the field causing various diseases in the course of vegetation, in warehouses, or during germination. The destructive activity of certain fungi makes the seed formation impossible or causes the occurrence of rot during germination. According to the data in literature, there exists a relatively small number of parasites in sunflower seed. M. Noble, J. de Tempe, and P. Neergard (1958) and Naumova (1960) list a certain number of fungi mentioned in the literature as present in sunflower seed. However, there are few data on the harmfulness of certain fungus species. Some authors (Champion, 1964; Pierre et al., 1970) have been recently trying to solve the pathological problems of sunflower seed through the application of fungicides. The methods of wet filter paper and PDA nutritive substrate were chiefly used for the identification of fungus species. In the period from 1972 to 1975, comparative analyses were performed on treated and non-treated seed material of the Soviet varieties Peredovik and VNIIMK 8931. Each year, 100 seed samples were used. A large part of them was treated with TMTD compounds. The seed was incubated eight days at 20°C.

Perforated zinc plates 11x26 cm were used in the method of wet paper, and Petri dishes 10 cm in diameter in the method of nutritive

substrate. Each sample contained 2x100 seeds. Stereomicroscopes and biological microscopes were used for the identification of fungus species.

The most frequent fungi have been identified. The results are tabulated for a clearer presentation. They cover the percentage of infected seed and the frequency of infection. The latter feature is divided into the following categories:

- + - weak infection, to 5% of infected samples,
- ++ - intermediate infection, 5 to 20% of infected samples,
- +++ - strong infection, over 20% of infected samples.

The results in Table 1 indicate that certain fungus species were frequent in sunflower seed, particularly *Alternaria tenuis*, *Fusarium* sp., *Botrytis cinerea*, *Penicillium glaucum*, and *Trichothecium roseum*. Although the majority of the frequent fungus species falls in the categories of saprophytes and facultative parasites, they had a strong effect on the health condition of the seed. This was also observed in the hot beds where these fungus species caused or supported the process of rotting, which in turn caused the destruction of seeds and seedlings. It should be pointed out that the surface contamination of seeds decreased after the treatment of the seed. A clear example in this respect was *Alternaria tenuis* although it was also true for other fungi. It was noticed that *Botrytis cinerea* was very active in the process of rotting, i.e. it caused a decrease in the vitality of the seed. *Alternaria helianthi* should also be mentioned. In some years, this fungus causes large-scale drying up of leaves. Aćimović (1969) indicated its exceptional aggressiveness towards seedlings and young plants. This species is, therefore, a potential danger for the sunflower crop. The fungus *Fusarium moniliforme* also held our attention because it

Table 1

Fungus Flora in Sunflower Seed

| Fungus | Non-treated seed | | Treated seed | |
|----------------------------------|--------------------|---------------------|--------------------|---------------------|
| | % of infected seed | infection frequency | % of infected seed | infection frequency |
| <i>Alternaria tenuis</i> | 15-80 | +++ | 4-22 | +++ |
| <i>Alternaria helianthi</i> | 1-5 | + | 1-2 | + |
| <i>Botrytis cinerea</i> | 1-14 | ++ | 1-5 | ++ |
| <i>Fusarium moniliforme</i> | 1-12 | ++ | 1-4 | + |
| <i>Fusarium sp.</i> | 2-18 | ++ | 1-7 | + |
| <i>Verticillium sp.</i> | 1-10 | ++ | 1-4 | + |
| <i>Cladosporium herbarum</i> | 2-10 | ++ | 1-3 | + |
| <i>Acremonia atra</i> | 1-6 | + | 1-2 | + |
| <i>Epicoccum purpurens</i> | 1-4 | + | 1-2 | + |
| <i>Penicillium glaucum</i> | 2-16 | ++ | 1-4 | + |
| <i>Stemphylium sp.</i> | 1-5 | + | - | - |
| <i>Trichothecium roseum</i> | 1-9 | ++ | 1-2 | + |
| <i>Rhizopus nigricans</i> | 2-10 | + | 1-2 | + |
| <i>Oedocephalum glomerulosum</i> | 1-3 | + | - | - |

participated in the process of wilting, i.e. drying up of plants. This fungus is also found in corn seed material. Together with *Fusarium graminearum*, it causes the lodging of corn plants in the course of vegetation. The sclerotia of *Sclerotinia libertiana* Fuckel, were spread sporadically in the seed samples. *Plasmopara halstedii* (Far.) Berl et de Tony is a separate problem in sunflower production from time to time.

The research indicated the presence of a number of micro-organisms in sunflower seed. The most frequent were the fungi from the categories of saprophytes and facultative parasites, namely *Alternaria tenuis* Auct., *Trichothecium roseum* Link ex Fr., *Penicillium glaucum* Link., *Fusarium* sp., *Botrytis cinerea* Pers. ex Fr., etc.

Although *Botrytis cinerea* Pers. ex Fr. was not particularly frequent, it was the most pathogenic fungus species on sunflower seed. The presence of a strongly pathogenic species *Alternaria helianthi* should also be mentioned because this species causes large-scale drying up of leaf bulk from time to time.

Alternaria tenuis Auct. was the most frequent and the most numerous species. The species *Trichothecium roseum* Link ex Fr., *Penicillium glaucum* Link, *Rhizopus nigricans* Ehrenb. et Cords, *Fusarium* sp., etc., occurred on a large scale on the seed material with reduced vitality.

The sclerotia of *Sclerotinia libertiana* Fuckel. were spread sporadically in the seed samples. *Plasmopara halstedii* (Far.) Berl et de Tony is a particular problem in sunflower seed production in some years.

References

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