

## SHORT COMMUNICATION

Occurrence of *Phytophthora* Rot of Soybeans in Hungary

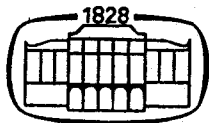
By

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ИЗДАТЕЛЬСТВО АКАДЕМИИ НАУК ВЕНГРИИ

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The first occurrence of *Phytophthora* rot of soybeans in Hungary is reported. The causal fungus *Phytophthora megasperma* var. *sojae* identified by microscopic studies and pathogenicity tests, is described as well.

The disease caused by *Phytophthora megasperma* (Drechs.) var. *sojae* A. A. Hildebrand (syn. *P. sojae* Kaufmann & Gerdemann) was first observed in the USA in 1948 (SUHOVECKY and SCHMITTHENNER, 1955). More recently KUAN and ERWIN (1980) have re-named the fungus *P. megasperma* f. sp. *glycinea*. To the best of our knowledge, its occurrence has not been reported from other countries than USA and Canada (ATHOW, 1973; SINCLAIR and SHURTLEFF, 1975).

In the spring of 1979, however, symptoms typical of *Phytophthora* rot were observed in Hungary (village Tápíószele), too. The damage was detected on the soybean cultivars Merit and ISz-13, ISz-14, KZ-237 (Hungarian ones), seeds of which originated from Iregszemcse (Western-Hungary). The causal fungus was found in Hungary as early as 1974 on cv. Merit, but no formal description of it has been given (SZILI, 1975).

*Phytophthora* rot can be found in soybeans at any stage of development. The infected seeds may die before emergence, especially in wet soil. Post-emergence root and stem rot cause wilting then death of the seedlings (Fig. 1). Older plants are killed more gradually. Leaf wilting is a common symptom of late infected plants. After the plant died, withered leaves remain attached for a week or so.

The fungus was isolated from soybean seeds having been surface sterilized in 0.2% NaOCl and 70% ethanol for 2 min, respectively, then placed into moist chamber. Small pieces of the mycelium developed under the above circumstances were transferred onto potato-dextrose agar (PDA) containing 100 µg/ml chloramphenicol. Cultures (Fig. 2) were kept at 25–27°C and, illuminated with fluorescent lamp for 12 hrs a day.

The young mycelium was coenocytic, but became septate with age and produced branches with constrictions at their base. Width of hyphae grown on PDA averaged 4–9 µm. Sporangia did not develop on PDA, but can be obtained from culture in pea broth or lima bean extract. The size of the obpyriform non-papillate sporangia is 39–60 × 34–51 µm. Sporangia germinate with ovoid, two-



Fig. 1. Damage caused by *P. megasperma* var. *sojae* on seedling of soybean cultivar ISz-13

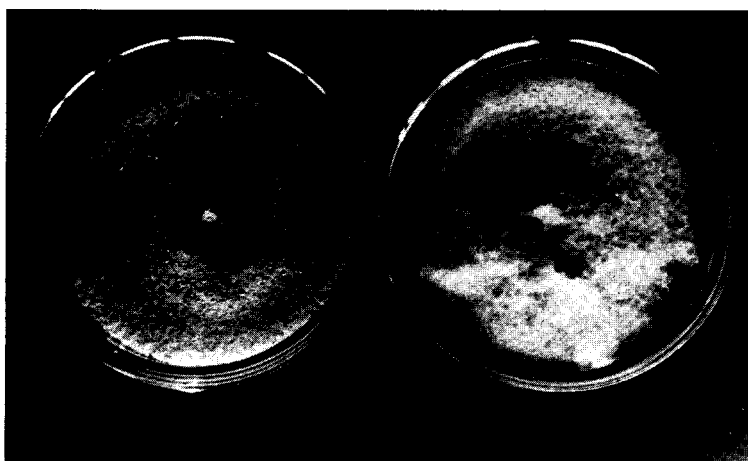


Fig. 2. Three-week-old culture of *P. megasperma* var. *sojae* on potato-dextrose agar



Fig. 3. Sexual process between oogonium and antheridium.  $\times 1350$

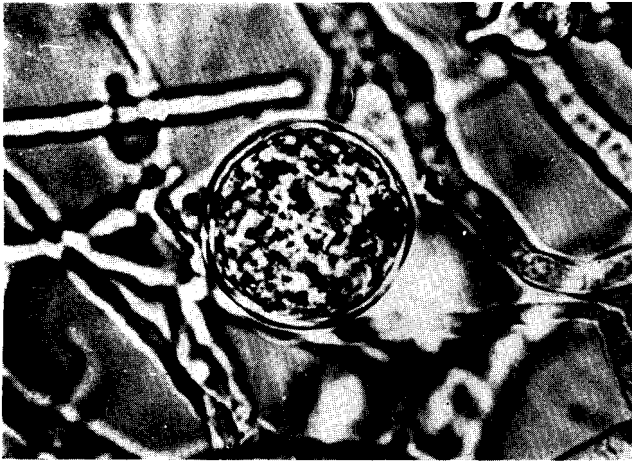


Fig. 4. Cospore of *P. megasperma* var. *sojae* produced on potato-dextrose agar.  $\times 900$

flagellate zoospores or directly, functioning as conidia. Sexual organs, the thin walled, spherical oogonia and the paragynous antheridia developed abundantly on PDA. Fertilization of an oogonium by an antheridium results in the development of an oospore (Fig. 3). Oospores have thick, smooth double wall and fine grained cytoplasm (Fig. 4). Their average size was  $38.4$  ( $28.8-43.2$ )  $\mu\text{m}$ . The oospores germinate by producing germ tubes from which hyphae then sporangia develop.

Pathogenicity test was carried out on 10-day-old seedlings of cv. Harosoy by using the method 8 of KAUFMANN and GERDEMANN (1958). Introduction of a suspension of minced mycelia into the hypocotyls resulted in the complete death of the plants within 7–10 days. The plant debris put into moist chamber offered an object for reisolation of the fungus.

The isolates of *P. megasperma* var. *sojae* exhibit various rate of virulence (HILDEBRAND, 1959; HILTY and SCHMITTHENNER, 1962; AVERRE and ATHOW, 1964). Physiological specialization of this fungus is also well known. Nine races as well as soybean cultivars differing in reaction to these races have been reported so far (MORGAN and HARTWIG, 1965; SCHMITTHENNER, 1972; SCHWENK and SIM, 1974; HAAS and BUZZELL, 1976; LAVIOLETTE and ATHOW, 1977). The 9 races are distinguished by using differential soybean cultivars as follows: Harosoy, Harosoy 63, Sanga, Mack, Altona, Tracy, P.I.171.442 and P.I.103.091. In the lack of this series we have not been able to complete race identification work.

Race identification, assessment of incidence, as well as comparative studies on Hungarian cultivars are in progress.

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