

**ROLE OF TELEOMORPH IN THE LIFE CYCLE OF GRAPES  
EXCORIOSIS CAUSAL AGENT /DIAPORTHE PERJUNCTA  
NISSL/ FOR THE CONDITIONS OF SOUTH BULGARIA**

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**ABSTRACT.** In historical aspect information about excoriosis has been found first during 1853. Most of the authors assume that the pathogen overwinters as pycnidia on the canes and mycelia in the buds, and the role of teleomorph has not been revealed till lately. The purpose of this study has been to investigate role of teleomorph in life cycle of grapes excoriosis. Experiments have been carried during 2001/2002 and 2003/2004 growing seasons in the field and laboratory conditions. Analysis of results from investigations, give reason to concluded that in South Bulgaria, region of Plovdiv, sexual stage (teleomorph) known a as *Diaporthe perijuncta* Nissl is formed on regular basis. This have been discovered for the second time in Europe and for the first time in Bulgaria and on the Balkans. Data received give reason to accept that in pathogen life cycle perithecia are source of primary inoculums for the conditions of South Bulgaria.

**KEY WORDS.** grapes diseases; excoriosis, *Phomopsis viticola*, *Diaporthe perijuncta*

### **INTRODUCTION**

In historical aspect information about excoriosis has been found first during 1853 (Fabre, Dunab, 1853, by Galet, 1977). Authors consider that disease exists from much earlier times.

In Europe first reports about excoriosis come from France in 1925 (Ravaz, Verge, 1925). Later the disease has spread in all parts of the world where grapes are grown Galet, 1977/.

In Bulgaria Kovatchevski has made first communication in 1955. During 1976 Hristov (Hristov, 1976) publishes data about disease losses in grapes nurseries in

Mezdra region (close to Vratza) during 1968. In the period after 1980 excoriosis has been found in some regions of South Bulgaria (Malenin, 1985; Nakov, 1986). Detailed investigations on bioecology of the causal agent for the ecology conditions of Bulgaria have been done Todorova (1997) and Mohsen Rehab (2002).

Despite long history of the causal agent, in literature there are indistinct moments in its biology, regarding the role of teleomorph in life cycle of the pathogen, in different parts of the world.

In Europe Phillips has published data about sexual form in Portugal in 1999. Teleomorph has been isolated and identified as *Diaporthe perijuncta* Nissl. Detail information about perithecia and ascospores has been reported later by Mostert and co-workers (2001).

Investigations on disease life cycle, overwintering and epidemiology have been carried by lots of researchers (Fabre, 1859, by Galet, 1977; Pine, 1959; Burget, 1984; Bulit et al., 1972; Kast, 1991; Nall; 1999; Nakov, 1986; Todorova, 1997; Erinck et al., 2001; Mohsen Rehab, 2002).

Most of the authors assume (accept) that the pathogen overwinters as pycnidia on the canes and mycelia in the buds (Pine, 1959; Burget, 1984; Nall, 1999; Nakov, 1986; Todorova, 1997). They appear to be sources of primary infection. Bulit et al. (1972) considers that pycnidia are main overwintering form of the causal agent in diseased tissues, and are found particularly at the basic internodes of canes. For spore formation pycnidia has to experience wet conditions for at least 60<sup>ty</sup> days. Bulit (1972) accepts that perithecia as overwintering stage had not been studied but assumes that possibility (Bulit et al., 1972). Mycelia can be found mainly in buds on basic internodes. From infected buds early spring diseased shoots appear, that can be source of primary inoculum. Infection can take place when young shoots are 1-2 to 20-25 cm long (Willison et al., 1964, by Galet, 1978). Spores can germinate in temperature interval from 1 to 37°C. When relative humidity is between 97-99% and temperature is 23°C, conidia germination can take place in 1.5 – 3 hours (Brendel, 1970, by Burget, 1984).

In Bulgaria Malenin (1985), Nakov (1986) and Todorova (1997) consider that the causal agent overwinters mainly as pycnidia and mycelia on grapes canes.

## **MATERIAL AND METHODS**

The purpose of this study has been to investigate role of teleomorph in life cycle of *Phomopsis viticola*. Experiments have been carried during 2001/2002 and 2003/2004 growing seasons in the field and laboratory conditions.

Observations on diseased canes with clear symptoms have been done in the following variants:

- Vines variety Bolgar (Brestnik region), 50 basic internodes with symptoms, have been tagged;
- 50 canes, with symptoms, have been laid on soil surface in the vineyards;
- 50 canes, with symptoms, have been kept in laboratory conditions – varying temperatures /2-9°C и 15-24°C/ and period of wetting every 10-12 days;

Experiments have been done during winter-spring seasons. Observations have started in the second half of December, and have been done on 15 days intervals till the beginning of the growing season.

## RESULTS

During the period of studies done (2001/2002 and 2003/2004) in laboratory and field conditions on diseased canes in some of the blotches, perithecia have been found in all three variants of the experiment, after interval of 81-98 days (fig. 1). They are formed scattered and in groups on the surface. Perithecia body is submerged in plant tissues and only perithecia neck is over the surface. The neck is long 887,9 - 1229 (av. 1050, 4)  $\mu\text{m}$  and has dark gray color (fig. 2). In perithecia asci and ascospores have been formed (fig. 3). Ascospores are one-celled when they are young. Later they become two-celled, elliptical and slightly pointed at the ends. Their size is: length 10.88-13.65 /av. 12.36/  $\mu\text{m}$  and width: 4.08-6.8 (av. 5.5)  $\mu\text{m}$ . Ascospores are formed in cylindrical prolonged asci: 57.8-68 (av. 64.46)  $\mu\text{m}$  X 6.12-10.54 (av. 7.94)  $\mu\text{m}$ .

Pathogenicity has been proved by Koch postulates, based on inoculation of young vines with monoascospore cultures.

Data received about morphological characteristics of teleomorph, asci and ascospores correspond to those published by Mostert and co-workers (2001).

Analysis of results from investigations carried in the laboratory and in the field, give reason to concluded that in South Bulgaria, region of Plovdiv, sexual stage (teleomorph) known as *Diaporthe perijuncta* Nissl (Mostert et al., 2001) is formed on regular basis.

## CONCLUSIONS

Based on investigations that have been carried following conclusions can be done:

- For the second time in Europe and for the first time in Bulgaria and on the Balkans, teleomorph stage of *Phomopsis viticola*, known as *Diaporthe perijuncta* Nissl /Mostert et al., 2001/ have been found, isolated and identified.
- Data received from the field experiments give reason to accept that in pathogen life cycle perithecia are source of primary inoculums for the conditions of South Bulgaria.

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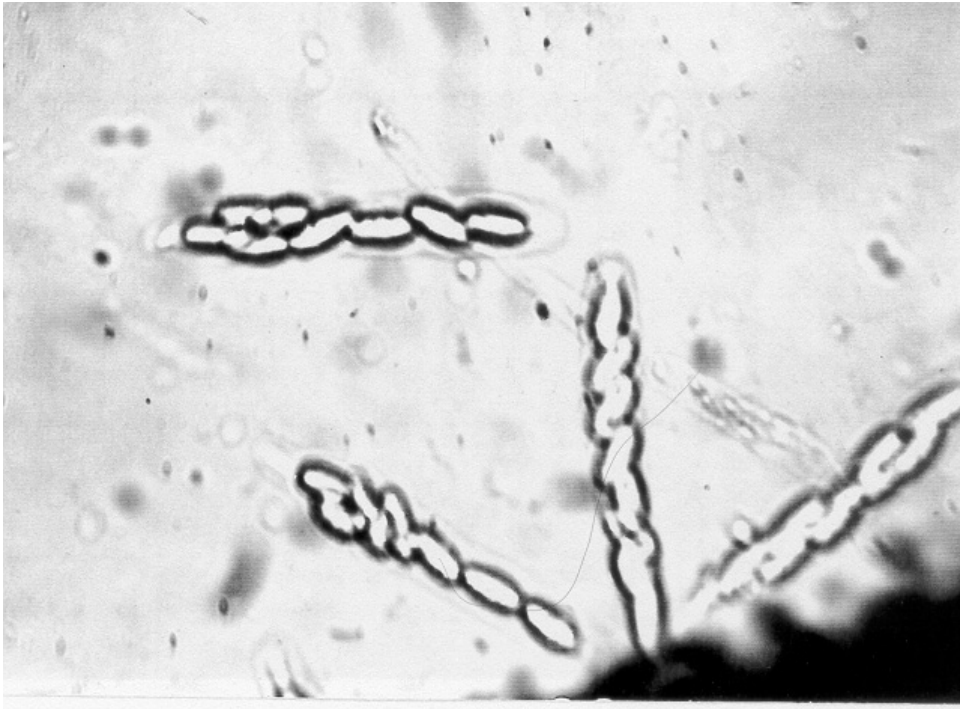
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**Figure 1.** Teleomorph stage of *Phomopsis viticola* – *Diaporthe perijuncta*, on grapes cane



**Figure 2.** Perithecia neck on diseased cane cane



**Figure 3.** Asci and ascospores