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TAXONOMIC AND METABOLIC INVESTIGATION OF *BIPOLARIS* SPECIES

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The ascomycetous genus *Bipolaris* (Euascomycetes, Pleosporales, Pleosporaceae) contains melanin producing filamentous fungal species. Teleomorphic stages belong to the genus *Cochliobolus* together with the members of the other anamorphic genus, *Curvularia*; however, sexual reproduction has been rarely observed in nature. These fungi are frequently associated to graminaceous hosts and may infect corn, wheat, barley and rice causing devastating epidemics from time to time, primarily in tropical and subtropical regions. Climate change favours the spreading of these species in temperate regions, which underlines the importance of their study. The symptoms of *Bipolaris* infections begin with small necrotic lesions on leafs, which extends and cause notable yield losses. *Bipolaris* species produce a series of biological active secondary metabolites, which have or may have role in the pathogenesis. They produce various terpenoid compounds, such as sesquiterpenes, diterpenes and sesterterpenes. The sesterterpene-type ophiobolins constitute one of the most remarkable groups of these bioactive metabolites. Apart from their phytotoxic effects, several ophiobolin analogues have antimicrobial, antiviral, cytotoxic, anticancer, or nematocidal activity.

Besides plant pathogenicity, the genus is also known about their difficult species identification and confused taxonomy. Traditional morphology based methods are unsuitable for the precise species identification because of the similar characteristics, molecular identification based on the frequently used nuclear ribosomal ITS region is also problematic. In the present study, new markers potentially suitable for molecular identification were tested.

Our study demonstrated that the ITS region, the *calm*, *tub* and *tef* gene sequences, which are routinely used for identification, are unsuitable to discern *Bipolaris* species. Instead of them the use of the intergenic spacer region (IGS) of the nuclear ribosomal RNA gene cluster is suggested, in which species specific motifs were determined to distinguish the *Bipolaris* isolates. Furthermore, ability of *Bipolaris* and *Cochliobolus* isolates representing 23 different species to produce ophiobolin A, the best known phytotoxin of these fungi, was also investigated. Six of the tested isolates produced remarkable amounts of ophiobolin A (>1 mg/g [dry weight]). The secretion kinetics of the examined strains has been determined by HPLC technique during a 12 days long cultivation and found to be aggregated in four different groups according to the results.

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