Identification of Soil Fungi Isolated From Alfalfa Plantation (T. Yudiarti et al.)

197
Identification of Fungi Isolates

Number of fungi identified in this study was 38 isolates. To identify them, they were growth on PDA which added chloramphenicol antibiotic to protect bacterial growth. All plates were placed at 25°C and examined at regular intervals for observing morphology colony and microscopic preparation like producing of hyphae, sporangia, oogonia and reproduction structures. Identification of all isolates were used the key books from Alexopoulos and Mims (1979), Plaat Niterink (1981), Robertson (1979), Ganjar et al., (1999), Dhingra and Sinclair (1985) and Gam et al. (1987).

RESULTS

Identification of fungi isolated from the soil alfalfa plantation showed that most of them have almost the similar characters and that all isolates were belong to six species and one was unidentified. Those species were Aspergillus sp, Cuninghammela sp, Eupenicillium sp, Pythium sp, Trichoderma sp and Vertilicium sp. This finding was according to the key book from Alexopoulos and Mims (1979), Robertson (1979), Plaat Niterink (1981), Gam et al (1987), Dhingra and Sinclair (1985), and Ganjar et al. (1999).

The species that was obtained: 1) Aspergillus sp (Figure 1) was conidiophores consisting of a so-called “foot-cell” and an branches stipe mostly without septa, which terminates in a vesicle. The conidia may be aggregated in columns or diverge in a radiating manner. Some of them can produce large, thick-walled, hyaline cell; 2) Eupenicillium sp (Figure 2) produce structure with multi-cellular that called ascomata, The ripening of ascomata take a long time. Asci are produced either in chains or singly from crosiers; 3) Cuninghammela sp (Figure 3) produce sporangiola. Their colony grows fastly, initially white colour turn to dark grey. Sphorangiphores have branches, verticillate or solitare; 4) Pythium sp (Figure 4) produce sporangia, zoopores. Sporangia are terminal or intercalary. Most species have smooth-walled oogonia, and are homothallic. Some species are heterothallic. Heterothallic species only develop oogonia in mating of two opposite strains. Some species have ornamented oogonia; 5) Trichoderma sp (Figure 5) produce spora, conidia. They fast grow and easily sporulate green colonies have been listed in almost every soil fungal analysis. Conidiophores are irregularly verticillate and bear cluster of flask-shape phialides. Vegetative colonies can be recognized by fast and thin growth, wide hyphae and characteristic smell, somewhat reminiscent of camphor. They also produce large hyaline chlamydospores; 6) Vertilicium sp (Figure 6) produce colony with white to pale yellow. Reverse colorless, yellow or ochraceous. Phialides solitary or in whors arising from conidiophores or from slightly differentiated prostrate aerial hyphae. Some species absent in chlamydospores.

DISCUSSION

In this study PDA medium for observing and growing of all fungi was chosen. This because the medium was suitable for all microorganism including fungi. According to Dhingra and Sinclair (1985), Ganjar et al. (1999), medium is belong to one of common medium means that the medium is suitable for growing fungi and also bacteria, while to protect for other microorganism except fungi which grows in the medium then was added with chloramphenicol antibiotic. Antibiotic like chloramphenicol is not preferable for bacteria growing but appropriate for fungi. As mention by Murwani (2008) that the function of chloramphenicol antibiotic in the body of bacteria is to protect protein synthesis. Therefore if it occur then it will affect to the life of the bacteria.

The findings showed that in the soil of alfalfa plantation there were many kinds of fungi can grow. This findings was agree with the findings of Chen et al. (2008) that the soil planted which legumes has been found fungal community, Yudiarti (2007) that the population of soil born microorganism including fungi generally range from 250 to 3,000 propagul per gram soil.

Some of the species which were found in this study and have been identified were Aspergillus sp, Pythium sp, Trichoderma sp and Vertilicium sp. As mention by Alexopoulos and Mims (1979) that all species were belong to the common species of soil fungi. In addition, those species were also found by Eapen et al. (2005) and Chavarriaga et al. (2007). The other species e.g. Cuninghammela sp, and Eupenicillium sp are also species which belong to soil born fungi and they are ubiquitous in soil (Alexopoulos and Mims, 1979).
One of the findings fungi found in study was not unidentified. This was pointed to the character of some fungi was not clear. The reason was it might be the fungi was belong to specific fungi that needs the using a selective media. According to Baruch and Stack (1990), the specific fungi needs a selective medium for their growing and for appearing of all their character. In this study used PDA medium which was not belong to selective medium and that may be the problem.
why the unidentified fungi difficult to grow.

CONCLUSION

In conclusion, it was obtained six species and one unidentified from the identification of soil fungi isolated from alfalfa plantation in Baturaden, Purwokerto-Central Java. The six species were Aspergillus sp, Cunicinghamella sp, Eupenicillium sp, Pythium sp, Trichoderma sp and Vertilicium sp.

REFERENCES

Alexopoulos, C. J. and C. W. Mims. 1979. Introductory Mycology. Third Edition. John Wiley and Sons.

Baruch, S. and J. Stack. 1990. Selective medium for isolation of Mycoleptodiscus terrestris from soil sediments of aquatic environments. Applied and Environmental Microbiology. 56(11):3273-3277

Chavarriaga, D., W.J. Bodles, C. Leifert, L. Belbahri and S. Woodward. 2007. Phytophthora cinnamomai and other fine root pathogens in north temperate pine forests. FEMS Microbiol. Lett. 276(1):67-74.

Chen, M., B. Chen and P. Marschner. 2008. Plant growth and soil microbial community structure of legumes and grasses grown in monoculture or mixture. J. Environ. Sci. 20(10):1231-1237.

Cook, R. J and K. F. Baker. 1983. The Nature and Practise of Biological Control of Plant Pathogens. The America Phytophathological Soc. Minnesota.

Dhingra, O. D. and J. B. Sinclair. 1985. Basic Plant Pathology Methods. CRC Press, Inc, Boca Raton, Florida.

Eapen S.J., B. Beena and K.V. Ramana. 2005. Tropical soil microflora of spice-based cropping systems as potential antagonists of root-knot nematodes. J. Invertebr. Pathol. 88(3):218-25.

Finck, A. 1982. Fertilizers and Fertilization. Introduction and Practical Guide to Crop Fertilization. Verlag Chemie GmbH, Florida.

Gam, W., H. A. Van der Aa, A. J. Van der Paats Niterink, R. A. Samson and J. A. Staplers. 1987. CBS Course of Mycology. Centraal Bureau Voor Schimmemcultures. Baarn.

Ganjar, I., R. A. Samson, K. Van den Tweel-Vermeulen, A. Oetari dan I. Santoso. 1999. Pengenalan Kapang Tropik Umum. Yayasan Obor Indonesia. Jakarta.

Jones, G. 1987. Plant Pathology. Principles and Practise. Open University Press. England.

Murti, R. 2008. Aditif Pakan. Aditif Alami Pengganti Antibiotik. Unnes Press, Semarang.

Robertson, G. I. 1980. The genus of Pythium in New Zealand. New Zealand J. Botany. 18: 73 – 99.

Van der Plaat Niterink , A. J. 1981. Monograph of The Genus Pythium. Studies in Mycology No. 21. Centraal Bureau voor Schimmemcultures, Baarn. 242 p.

Yudiarti, T. 2007. Ilmu Penyakit Tumbuhan. CV. Graha Ilmu, Yogyakarta.