

## EXECUTIVE SUMMARY OF THE MINOR RESEARCH PROJECT

### TITLE OF THE PROJECT : STUDIES INTO THE GENUS – *APLOSPORELLA* SPEG.

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#### Objectives of the project :

Many of the fungi are 'riddle' in the phylogenetic relationships; such fungi always play a vital role. To study relationship of *Aplosporella* with perfect stage, cultural studies, must be done. In cultural practice, the development is easily studied. The cultural studies also reveal nutritional requirements of the fungus. Nutritional and climate requirements may strike the imperfect form to perfect form. Development of perfect forms is then easily seen. The mode of development will help in solving riddle of phylogenetic relationships and also help in the investigation of the relationships of the said fungus to other than two well – known perfect forms i.e. *Bagnisiella* and *Tryblidiella*.

#### Major Findings :

During 2010 – 2012, the investigator made about 30 collections of the form – genus *Aplosporella*, mostly in the form of saprophytes growing on dried branches of various host plants. These collections also included some pathogenic forms inciting leaf spot on *Citrus karna*. These collections were studied in detail in respect to their morphology and identify. Based on morphological characters, comparative studies and host – relationships, 10 proved to be new to science and as such described here as new species.

In the cultural study, 5 isolates of *Aplosporella* i.e. *A. labiatae*, *A. rubiae*, *A. coniferae*, *A. citrae* and *A. brossimumii* were designated as isolate L, R, Co, Ci and B respectively obtained from diversified plant hosts, with a new to determine whether such a study would be of any value in the taxonomy and speciation of this highly cosmopolitan genus. Since, currently speciation in this genus is largely based on purely morphological characters and host relationship. Total 15 culture media including non-synthetic and synthetic media were employed for this study. Growth and radial spread was profuse in all isolates on PDA. Isolate Ci showed maximum formation of pycnidial development followed by isolate B, R, L showed scanty fruit bodies. Wheat – extract agar, Malt – extract agar, Pea – seed extract agar and Cucumber fruit – extract agar supported tufty mycelia growth and pycnidial development for all the isolates. In Spinach leaves – extract agar, isolate L, R, B had good formation of pycnidial bodies, whereas isolate Co and isolate Ci responded poorly in this respect. On Malt – agar, pycnidial develop in good amount in isolate R and B while in isolate L and Co, pycnidia just started developing whereas there is no growth of pycnidia in isolate Ci. In nutrient agar medium, the pycnidial formation in



isolate L is better than the rest of the isolate. Isolate Co, Ci and B showed better vegetative growth. In little – goured fruit extract agar, all the isolates. (except isolate R) showed better vegetative and reproductive growth while in host – extract agar all the isolate (except isolate Ci) showed good vegetative and reproductive growth. Among synthetic media, Asthana and Hawker's Agar media proved to be the best for growth as well as pycnidial development for all the five isolates of *Aplosporella*. In Catino-PYG- agar media isolate R and Co showed better mycelia growth and pycnidial formation than rest of the isolates. In Richards agar, all the isolates except Ci showed profuse mycelial and pycnidial growth. Petri medium was very poor in this respect. Good vegetative growth of all the isolates was witnessed in Park medium.

From the results obtained with the cultural studies, it is apparent that, in general non-synthetic media proved to be better both for growth and pycnidial development as compared to the synthetic ones except Asthana and Hawker's Agar medium. Two isolates viz., R and B showed development of ascigerous (perfect) states like immature stroma of *Bagnisiella* and a pothecial bodies. The results obtained in cultural studies were variable among the five isolates with respects to growth and pycnidial development. Isolates R and B could only develop perfect states in culture media. Besides, it is interesting to note that isolate B showed development of immature stroma of *Bagnisiella* in three different media (viz., Asthana and Hawker Agar, Pea-seed – extract Agar and wheat – extract Agar media). Isolate R showed development of immature apothecial bodies in a single medium (viz., Wheat – extract Agar medium).

In the physiological study, two factors were undertaken i.e., physical and nutritional factors. The physical factors like light, temperature and humidity were employed for the study of growth of pycnidial development of five isolates of *Aplosporella*. It showed that all the isolates in all the light treatments showed formation of pycnidia but with varying intensity. Except red, blue, green, yellow and day – light, all the isolates showed profuse vegetative and reproductive growth in continuous artificial light. It is evident that all the isolates in general showed better growth at 25 – 30°C (room temperature) which appeared to be their optimum temperature. These isolates failed to grow at 0°C, 5°C and 15°C. It is interesting to note that all the five isolates of *Aplosporella* in all the four types of humidity levels showed the development of mycelia as well as fruiting bodies.

Nutritional factors like pH, carbon sources and nitrogen sources were employed for the study of vegetable and reproductive growth of five isolates of *Aplosporella*. On an average all isolates responded poorly at pH level 4, 5, 7, and 8. pH level 6 – 6.5 were found to be an optimal range for good growth in all isolates. Thus, it is clear that all isolates of *Aplosporella* have a tendency to grow in slightly acidic pH. Isolate L, R and Ci showed better response comparatively to all the carbon sources. None of the isolates, surprisingly, sporulated in the carbon source like dulsitol. In the study of influence of nitrogen sources, from the results, it is concluded the all the five isolates of *Aplosporella* grows better in inorganic nitrogen sources than the organic nitrogenous sources.

Chromatographic study of the isolates of *Aplosporella* has also been studies. In this study, amino acids, carbohydrates and organic acids were analysed. From the result, it is evident amino acid like D – L methionine and D – L tryptophan are invariably present in all the five isolates of *Aplosporella*. Carbohydrates like glucose, fructose, sucrose and maltose were detected in the cultures of five isolates of *Aplosporella*. Organic acids like fumaric acid was detected in isolate L, R and B. Malic acid was found in isolate R and B. Malaric acid was found in isolate L and Ci while citric and appears in isolate L and Co.



(Signature of principal investigator)

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