



SCIENTIFIC REDISCOVERY OF FUNGOID BODIES AND HABITAT STUDIES ON *SCLEROTIUM STIPITATUM* BERK. ET CURR. (NILAMANGA): A RARE TERMITE FUNGUS.

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ABSTRACT: Fungi in genus *sclerotium* Tode form sclerotia and sterile mycelia but no spores. *Sclerotium stipitatum* Berk. ET Curr, ('Nilamanga') is a rare endemic fungus identified from Travancore area of South India in this genus. It is first identified by Berkeley in 1860 from its natural habitats of this area with ants nest. He commended on the described materials was three types of fungoid bodies. Further no more reports are available to support the existence of these species. After the type specimen this collection of 3 fungoid bodies are the scientific rediscovery of this species. Ethnobotanical studies of 'Nilamanga' is effective in curing a number of ailments, such as ear ache, stomach pain, dehydration and even stomach cancer and jaundice.

Key words: *Sclerotium stipitatum*, Nilamanga, Puttumanga, Hypogeal fungus.

INTRODUCTION

Fungi in genus *Sclerotium* Tode form sclerotia and sterile mycelia but no spores. *Sclerotium* include more than 40 plant pathogenic species. Many *sclerotium* species do not or rarely reproduce sexually and are known only from their asexual stage [1,2,3]. Many species of *Sclerotium* genus changed to the group of Basidiomycetes and Ascomycetes due the production of sexual spores. The major group they include *Peziza*, *Typhula*, *Athelia*, *Stromatinia*, *Sclectinia*, *Rhizoctonia*, *Thanatephorus* and *Ceratohiza* [4]. Others, again, are only known in the sclerotoid state, such as the *Sclerotium stipitatum* found in the nests of white ants in South India. Artificial culture of many *sclerotium* species produce their sexual stage and changed them to specific group. The anamorphic form of *sclerotium* changed to telomorphic form regarding their sexual stage. *S. stipitatum* still being remains as *sclerotium*. One more unauthentic reports regarding this species as *xylaria* [5]. There are some report regarding this species may be *Pezizza tuberosa* and *Xylaria nigripes* (Klotzsch) Sacco. Fredric Curry and Daniel Danberry (1860) recommended for more material bring from India to find out the perfect stage of this species. Berkely's opinion regarding the 3 materials of *S. stipitatum* collected from India is fungoid in nature. It is impossible to speculate as to what the perfect stage may be.

S. stipitatum, Berk. ET Curr. ('Nilamanga') is a rare endemic fungus identified from Travancore area of South India. It is first identified by Berkely in 1862 from its natural habitats of this area with ants nest. But this species is purely underground ants nest with holes and dried remnants of plants. It is very good and excellent medical use in Ayurveda and 'Parabharya vydyam' [7]. Ethnobotanical studies of Balakrishnanan and Anilkumar reveal that 'Nilamanga' is effective in curing a number of ailments, such as earache, stomach pain dehydration and even stomach cancer and jaundice. 'Nilamanga' has high potential to yield new drugs of commercial value. Moreover, this species is ecologically vulnerable, considering attributes like restricted spatial occurrence; distinct components of species very narrow habitat preference and a species subjected to greater pressure of over exploitation and habitat destruction. There is urgent need for conservation and proper study for this species.

MATERIALS AND METHODS

Fresh *S. stipitatum* were collected from local areas of Cherpulassery and Vellinezhi, Palakkad and East Mangad, Thrissur district for the experimental purpose. The collected materials are washing thoroughly, shade dried, and stored in well closed containers till further uses.

RESULTS

S. stipitatum is commonly called 'Nilamanga' (Nila - Ground, Manga - Shape of mango) and 'Puttumanga' (Termite nest mango). These names representing very old underground ant's nest (Puttu) growing hypogean fungus with the hyphae produce black colour sclerotium. Their sclerotium is long living and appears singly or bunches with narrow stalk. They attached to grow in an underground termite nest with old remnants of roots. The shape of sclerotium varies and its size is equals to more or less hen's egg. When compared to other fungus their habitat is quite different. There are two different forms of *Sclerotium* species was collected from their natural habitat. The most prominent and large one are produced in bunches. Their posterior end become notched and flattened at their maturity (Fig 1. C). At their early young stage the posterior end become pointed and produce a beak like structure (Fig 1. A, B). In its young stage it stands erect singly in an underground puttu hole, and they are very small in size. The second variety has very strong many bended stalks (Fig 1. D). The narrow basal stalk of this variety joins to sclerotium laterally and this variety present in high humidity puttu heaves. The difference in sclerotium may become different species of *S. stipitatum*. The different species of termite heave influence on the production of different morphological sclerotium. The cross section of this species shows a dark black outer covering with whitish inner region (Fig 1. E).



Figure :1

A, B, C, - First variety of *S. stipitatum* (A, B - Initial stage, C - Mature stage),
D - Second variety of *S. stipitatum*, E - Inner portion of *S. stipitatum*

DISCUSSION

The taxonomic position of this species is quite disputed. Morphologically this species similar to the genus *Xylaria* but differ in habitat and sexual stage. On university herbaria of California Berkely made a comment that *X. nigripes* was growing on ground over termite nest. A revision of *Xylaria* represents the *S. stipitatum* may become *X. nigripes*. Because both are connected with termite nest. But *X. nigripes* grown on the ground over the termite nest and the *S. stipitatum* abundantly distributed within the termite nest. So they are distinct in their habitat preference. The underground habitat of this species similar to that of the genus *Peziza* but they differ in their sexual stage. According Currey and Hanbury [6] on their fungus report book to the genus *sclerotium* come under the group 'sexual reproduction absent' (order Moniliales, with sclerotia or cellular bodies). In their words "Only three specimens which have hitherto reached this country drawn to their natural size. We are quite of Berkely's opinion that they are of fungoid nature, although it is impossible to speculate as what the perfect state may be. We think it is improbable that *S. stipitatum* might be treated so as to induce it to perfect its fructification; and we have some hope of procuring a further supply of specimen from India". The species *S. roseum* with asexual stage under artificial condition produce sexual stage and changed to genus *Peziza*. A clear cut taxonomical position has to be cleared with relevant evidences.

Ethanobotanical studies of Balakrishnan and Anilkumar [7] revealed that 'Nilamanga' is effective in curing a number of ailments, such as earache, stomach pain dehydration and even stomach cancer and jaundice. 'Nilamanga' has high potential to yield new drugs of commercial value. It is also a good nutritional food for health. It cures many chronic diseases and malnutrition deficiencies. The chemical content analysis is necessary for the reliable use of this material.

No more study other than one ethnobotanical study has been conducted in this species *Sclerotium stipitatum*. Due to scarcity and unavailability of materials of this species, hardly specific study has not been conducted still. But one ethnobotanical study about 'Nilamanga' reveals the preliminary nutritional and medicinal properties that utilized by tribals of Kerala [8].

CONCLUSION

Identity of this species is now in dispute. The study will provide the correct identification of this rare species. Many medicinal and nutritional properties of the species under study are known to the tribals. The biochemical studies of the species will provide scientific basis to this. The study will make future references in the field of taxonomy and medicine.

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