

## ***Septobasidium sterilis* sp. nov. from India**

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**TANAJI RAMCHANDRA KAVALE**

*Department of Botany, Ajara Mahavidyalaya, Ajara Tal.- Ajara Dist.- Kolhapur 416505 Maharashtra*

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An interesting Hymenomycetous new species belonging to the genus *Septobasidium* Patouillard viz. *Septobasidium sterilis* sp. nov. is illustrated and described. The species has been recorded for the first time in India hitherto, on the scale insect (*Aspidiotus hartii*) on the living leaves of *Cinnamomum zeylanicum* Bl. (Fam.: Lauraceae), *Atalantia recemosa* Wight (Fam.: Rutaceae).

**Keywords:** Hymenomycetes, Septobasidiales, *Septobasidium sterilis*

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### **INTRODUCTION**

In continuation of taxonomical studies on rust fungi, the author came across an interesting collections on the scale insect (*Aspidiotus hartii*) on the living leaves of *Cinnamomum zeylanicum* Bl. (Fam.: Lauraceae) and *Atalantia recemosa* Wight (Fam.: Rutaceae) belonging to the genus *Septobasidium* from Southern Kolhapur district (Maharashtra State, India) and its neighbouring areas. The genus *Septobasidium* was established by Patouillard in 1892 belonging to a single monogeneric family, Septobasidiaceae of the order Septobasidiales (Basidiomycetes). The order and the family is symbiotic-parasitic on scale insects characterized by gymnocarpic basidiocarps which are resupinate, smooth, nodulose and occasionally spinose. The genus has been monographed (Couch, 1981) and 165 species have been described with a key. However, there are 3 more genera in the family viz. *Coccidiodyctyon*, *Ordonia* and *Uredinella*. Scientist described the genus *Septobasidium* to about 135 species into 8 groups and the genus *Uredinella* made as synonym to *Septobasidium*. Based on the morphology and septation of metabasidium, 180 species have been accepted and divided into 9 groups (Moore, 1996). About 31 species in which probasidia do not produce metabasidia and basidiospores.

Today the genus is known by ca. 350 species and varieties (<http://www.indexfungorum.org/Names/Names.asp>, Dec., 2022). In India, about 5 species are reported (Jamaluddin *et al.* 2004).

### **MATERIALS AND METHODS**

The fresh living materials were collected repeatedly from two different localities of Southern Kolhapur district (Maharashtra State, India) and its neighbouring areas. These materials were critically studied by usual laboratory methods. The collections were identified with the help of up-to-date available literature to their respective genera, species and varieties along with their host plants. New taxon had been proposed and described purely on morphological basis and host specificity. Ranges of variations of the same taxon collected from different seasons were also taken into consideration. The materials had been deposited in Herbarium Cryptogamae Indiae Orientalis (HCIO), New Delhi, India and their duplicates in Mycological Herbarium, Department of Botany, Shivaji University, Kolhapur (Maharashtra State, India) under W. I. F. (Fungi of Western India) for future reference.

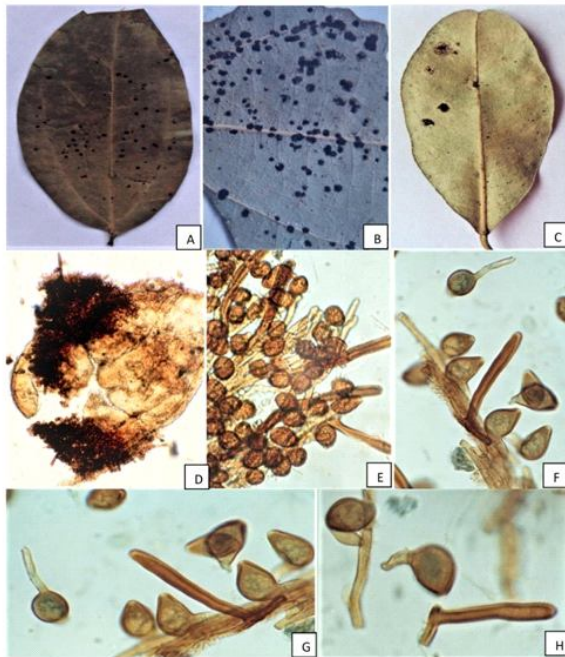
### **RESULTS AND DISCUSSION**

***Septobasidium sterilis* sp. nov.** Fig. 1(A-H), Fig.2.

Basidiocarpus gymnocarpus, resupinatus, glabratus, nodulose, creavisus et spinulosus,

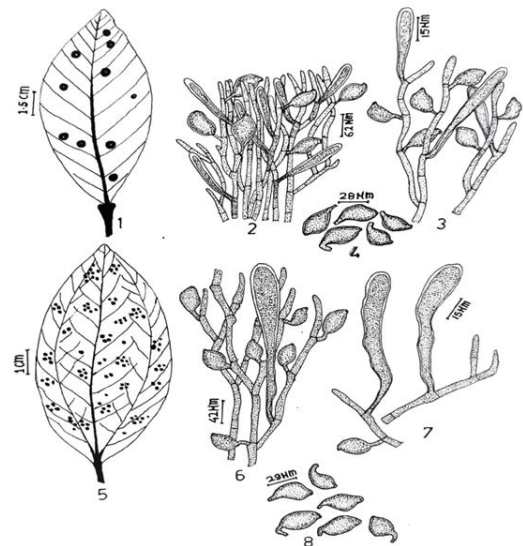
**Table 1:** Comparison of *Septobasidium sterilis* sp. nov. in different collections

Name of the Taxon	Host and Locality	Habit	Mycelium	Mycelial Appendages	Pro-basidium	Meta-basidium	Basidio-spores
<i>Septobasidium sterilis</i> sp. nov.	On scale insect ( <i>Aspidiotus hartii</i> ) on the leaves of <i>Cinnamomum zeylanicum</i> Bl. (Fam. : Lauraceae), Karpewadi Garden Ajara ( Dist. Kolhapur, Maharashtra, India)	Colonies 2-5 mm in diam.; amphiphyllous, mostly hypophyllous, chocolate.	Hyphae straight to sub-straight, alternate branching, cells 63-85 x 7-8 $\mu$ m	Golden-brown, cylindrical, 92-99 x 7-8 $\mu$ m	Stalked, brown, 37-43 x 11-12 $\mu$ m. alternate	Not seen.	Not seen.
<i>Septobasidium sterilis</i> sp. nov.	On scale insect ( <i>Aspidiotus hartii</i> ) on the leaves of <i>Atalantia racemosa</i> (Fam. : Rutaceae), Amboli (Dist.Sindhudurg, Maharashtra, India)	Colonies 5-6 mm in diam.; hypophyllous chocolate.	Hyphae straight to sub-straight, alternate, cells 26-62 x 6-8 $\mu$ m.	Golden-brown cylindrical, 70-74 x 7-8 $\mu$ m.	Stalked brown, 28-44 x 12-16 $\mu$ m. alternate or opposite	Not seen.	Not seen.



**Fig.1.** Infection of *Septobasidium sterilis* sp.nov., on the living leaf of *Cinnamomum zeylanicum* x 1/2 (A&B), on the living leaf of *Atalantia racemosa* x 1/2,(C) and Infection on the scale insect of *Aspidiotus hartii* (D); Mycelium with appendages and stalked probasidia x 220 (E), Magnified mycelium with appendages and stalked probasidia x 880 (F), Mycelial appendages and stalked probasidia x 980 (G&H).

amphigenus, plurimum hypophyllus, compactus, usque 2-5 mm in diametro, chocolate, basilaris subiculum et hypha columnen; hypha septatus et destitutus, directus et substratum, ramus alternus ad latus angulus, dense reticulates et formatus solidus mycelialis teges, cella 63-85 x 7-8  $\mu$ m; hymenium mycelialis appendiculatus et numerosi pedunculatus probasidia; mycelialis appendicula



**Fig.2:** Hand drawings of *Septobasidium sterilis* sp.nov on the scale insect (*Aspidiotus hartii*) on the living leaf of *Atalantia racemosa* (1) and living leaf of *Cinnamomum zeylanicum* (5); Mycelium with appendages and stalked probasidia (2&6), Magnified mycelium with appendages and stalked probasidia (3&7), Stalked probasidia (4&8).

aurantiacus-brunneus, simplex, sparsus, cylindricus, usque 92-99  $\mu$ m longus et 7-8  $\mu$ m latus, apex obtusus; rari appendicula longior usque 100  $\mu$ m; probasidia pedunculatus, alternus, sparsus, globosus aurantiacus, 1-cella, apicalis germ porosus, usque 37-43 x 11-12  $\mu$ m; metabasidia and basidiosporae non videntur.

### Holotype

In scale insect (*Aspidiotus hartii*) in foliis vivis *Cinnamomum zeylanicum* Bl. (Fam.: Lauraceae), Karpewadi Garden, Ajara (Dist.-Kolhapur,

Maharashtra, India), 23-11-2003, T. R. Kavale, et depositus H.C.I.O.- 47500 (a typus), W.I.F. – 2009 (isotype).

Basidiocarps gymnocarpic, resupinate, smooth, nodulose, creaviced or spinulose, amphigenous, mostly hypophyllous, dense, up to 2-5 mm in diameter, chocolate in colour, composed of basal subiculum and hyphal pillars; hyphae septate and without clamps, straight to substrate, branching alternate at wide angles, closely reticulate and forms almost solid mycelial mat, cells 63-85 x 7-8  $\mu\text{m}$ ; hymenium with mycelial appendages and many stalked probasidia; mycelial appendages golden-brown, simple, spreading, cylindrical, up to 92-99  $\mu\text{m}$  long and 7-8  $\mu\text{m}$  wide, tip obtuse; few appendages even longer than 100  $\mu\text{m}$ ; probasidia stalked, alternate, scattered, globose, brown, 1-celled apically with distinct germ pore, up to 37-43 x 11-12  $\mu\text{m}$ ; metabasidia and basidiospores not seen.

### Habit

On the scale insect (*Aspidiotus hartii*) on the living leaves of *Cinnamomum zeylanicum* Bl. (Fam.: Lauraceae), Karpewadi Garden, Ajara (Dist.- Kolhapur, Maharashtra, India), 23-11-2003, T. R. Kavale, H.C.I.O.- 47500 (a type), W.I.F.- 2009 (isotype).

The same species also collected on scale insect (*Aspidiotus hartii*) on the living leaves of *Atalantia recemosa* Wight (Fam.: Rutaceae), Amboli (Dist.- Sindhudurg, Maharashtra State, India), 17-01-2003, T. R. Kavale, H.C.I.O.- 47501, W.I.F. -2008. Comparative study on these hosts shows more similarities in certain respect while few variations in other respects, but metabasidia and basidiospores are not seen in these collections.

In the present study author repeatedly collected two different collections on the scale insects (*Aspidiotus hartii*) on two host plant genera viz. *Cinnamomum* and *Atalantia* since 2003, producing the colonies chocolate-brown, discrete, compact, circular, ambonate, variable in size (up to 2-6 mm) mostly on the lower surface or occasionally on both sides of the living leaves. Mycelium dark brown, septate, nodulose bearing probasidia, laterally alternate, apposite or occasionally in whorl of variable in size and shape and colonies bearing staught straight or repent spinose or obtuse tipped appendages or setae but never produce the metabasidium and basidiospores, even by the

collections where repeatedly collected and kept for germination in moist Petri plates. Therefore, without metabasidia and basidiospores it is rather difficult to assign the present collections to any known species. Moreover, present collections show more similarities in certain respect while few variations in other respects, plant hosts are variable in the described species. So these characters are not possible to utilize for identification of present collections. So, both these collections which were collected from two different localities of Southern Kolhapur district (Maharashtra State, India) and its neighbouring areas proposed to accommodate as a new species viz. *Septobasidium sterilis* sp. nov. based on the sterile nature of the collections.

Since the collections repeatedly occur every year on same plant on same insect host it is surprise to see its nature of the infection to its insect host might be other than basidiospores. It is probable that probasidia sometimes detached from hypha showing scars on the mycelia may function like the prophagule to infect the insect host but is not observed in the materials which were collected or fragments of mycelium may served as prophugule for infection. For time being they are all kept into this new taxon. In future there is a need to study further to observe whether metabasidia or basidiospores being produced or not. Comparison has been provided of two different collections from two host plants to show similarity and variability of collections ( Table -1).

During the field survey since 2003, it is observed that this species has been severely observed on scale insect *Aspidiotus hartii* on the living leaves of *Cinnamomum zeylanicum* as compared to *Atalantia recemosa*. The scale insect number was also comparatively more on *Cinnamomum zeylanicum*.

Regarding the species of the *Septobasidium* which are parasitized on 13 host genera of the scale insects and 98 plant host genera infested by scale insects in which 92 belonged to dicots, 03 monocots and 03 gymnosperm hosts. It is difficult that there exist host specificity of *Septobasidium* species to its respective scale insects as well as the scale insect to the host plant.

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