

# TWO NEW SPECIES OF *ALTERNARIA* NEES EX FR. FROM India

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## ABSTRACT

Two new species of *Altrania* collected from Botanical Garden, University and Rounak Nursery of Sagar, M.P. (India) causing leaf spots on living leaves of *Pedilanthus tithymaloides* (L.) Poir. (Euphorbiaceae) and *Centella asiatica* (L.) Urban. (Apiaceae) is described and illustrated. Type specimens have been deposited in H.C.I.O., New Delhi and the accession number is allotted. Morphotaxonomic treatment of isotype has been done by comparing with allied taxa in question and consulting the current literature.

**KEY WORDS:** *Altrania*, foliicolous fungi, hyphomycetes, morphotaxonomy.

## INTRODUCTION

On systematic and periodic survey of Sagar, M.P. (India) on 2004-05. A number of collections of living leaves exhibiting leaf spots and blights were encountered. Of these, upon critical examination and comparison of morphotaxonomic features with those of the allied forms two taxa of species rank have been found to be hitherto undescribed. This is described and illustrated as *Alternaria pedilanthii* and *Alternaria apicearum* Parihar et Rai sp. nov. parasitizing in the living leaves of *Pedilanthus tithymaloides* (L.) Poir. (Euphorbiaceae) and *Centella asiatica* (L.) Urban. (Apiaceae) illustrations have been executed with camera-lucida and latin diagnoses.

## MATERIALS AND METHODS

The specimens were collected from Botanic Garden of Dr. H.S. Gour University and Pankaj Nursery of Sagar, M.P. in India. The collected specimens were sprayed with aqueous HgCl<sub>2</sub> 0.1% solution to check the microbial decomposition and stored in airtight polythene bags along with naphthalene balls. Microscopic slides were prepared by using lactophenol cotton blue mixture. The slides were studied under the compound microscope in different combinations of eye pieces (10x, 12.5x, 15x) and objectives (10x, 40x, 45x and oil immersion). The desired camera lucida drawings of the interesting forms were made showing maximum diagnostic features available in the morphology and ontogeny of reproductive propagules and their measurements. The observation including symptomatology was then consolidated. The observations taken for each specimen were then compared with the forms already described about the particular fungus on the particular host species, host genus or host family, from India. The specimens constituting new records at least for this country and forms new to science were retained with care. Thus, the final sorting of specimens was done at this stage. Afterwards a thoroughly scrutinized and revised final host.

## RESULTS AND DISCUSSIONS

### Taxonomic Description

*Alternaria pedilanthii* S. Parihar et A.N. Rai sp. nov. (Fig-1.)

Maculae amphigenosae, parvae vel magnae, fusco atro, irregulares, pleraeque extendentes per totam superficiem folii. Coloniae epiphyllosae, obtusae instar atro. Mycelium hypharum, superficiale, ramosum, septata, laevia, pallide vel olivacea. Stromata bene evoluta, irregulares, pseudoparenchymatosa, superficiale, fusco brunnea, usque 100µm. in diametro. Conidiophora caespitosa densis fasciculis, interdum solitaria, plerumque ex stromatibus oriunda, macronematosa, mononematosa, simplicia, erecta, recta vel

flexuosa, laevia, ramosum, 2 vel 6 transversae septata, geniculata, plus minus cylindrica, medio olivacea, 10-82.5x4-8µm. Cellulae conidiogenae incorporate, terminales dein intercalares, sympodiales, polytreticae, cicatricatae cum 1 vel rari conidicus cicatricis. Conidia solitaria, recta vel curvata, obclavata, ellipsoidea, tenuibus parietibus, laevia, dictyosporosa, usque 7 transversae septata, 2 longitudinalis septata at usque 2 obliquosa septata, pleraeque colligatioonis ed septata, medio vel fusco olivacea, pleraeque conidicus apexicis longa angustum et interdum curvata, apicem obtusa, basim obconicotruncata vel subtruncata vel roundata, hilo crassato 16.5-148x7-26.5µm. Rostrum simplicia, 3-4.5µm crassa. Fig.-1.

In foliis vivis *Pedilanthus tithymaloides* (L.) Poir. (Euphorbiaceae) Feb.2005, Rounak Nursery, Sagar M.P. India, leg. S.Parihar S.U. Herb No. SRR-253 holotypus HCIO No. 46,417.

Lesions amphigenous, small to large, dark black, irregular, mostly covering whole surface of the leaf. Colonies, epiphyllous, looking like powdery black mass. Mycelium of hyphae superficial, branched, septate, smooth, pale to olivaceous. Stromata well developed, irregular, pseudoparenchymatous, superficial, dark brown, upto 100µm. in diam. Conidiophores caespitose in dense fascicles, sometimes solitary, mostly arising from stroma, macronematous, mononematous, simple, erect, straight to flexuous, smooth, branched, 2 to 6 transversely septate, geniculate, more or less cylindrical, mid olivaceous, 10-82.5x4-8µm. Conidiogenous cells integrated, terminal becoming intercalary, sympodial, polytretic, cicatrized, with 1 or few conidial scars. Conidia solitary, straight or curved, obclavate, ellipsoidal, thick walled, smooth, dictyosporic, upto 7 transverse septa, 2 longitudinal septa and upto 2 oblique septa, mostly constricted at the septa, mid to dark olivaceous, mostly the conidial tips are long narrow and sometimes curved, apices obtuse, bases obconicotruncate to sub truncate to rounded, hila thickened 16.5-148x7-26.5µm. Beak simple, 3-4.5µm. thick Fig.-1.

#### Material examined:

On living leaves of *Pedilanthus tithymaloides* (L.) Poir. (Euphorbiaceae), Feb.2005 Rounak Nursery, Sagar. M.P. India, leg. S. Parihar, S.U. Herb. No. SRR-253 holotype, HCIO No.46,417.

The present species has been compared with description and illustration of closely related species of *Alternaria* such as *A. ricini* (Yoshii) Hansford (Ellis, 1971) (Table-1). The table shows that both are similar in the general characters and length of the conidiophores but at the same time show great divergence from each other in all other important taxonomic characters. However, the author's collection has its distinct identity in having well developed stroma, branched & thick walled conidiophores having conidia with smaller dimensions as against *A. ricini* of the table. Therefore, it is concluded to describe & illustrate the proposed fungus as a new species of *Alternaria*.

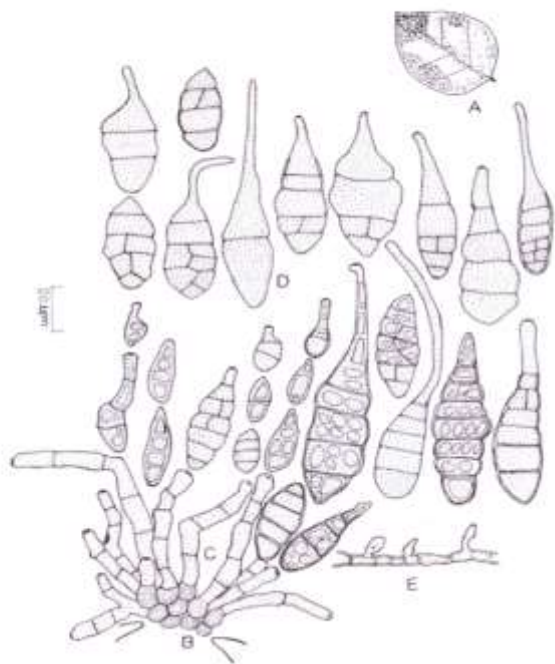


Fig-1: *Alternaria pedilanthii* S. Parihar et A.N. Rai sp. nov.

A- Symptom B- Stroma C- Conidiophores D- Conidia E-Repent hyphae

Table 1 : Comparative account of *Alternaria pedilanthii* sp. nov. with related species

<i>Alternaria</i> spp.	Spots & Colonies	Stroma	Conidiophores	Conidia
<i>Alternaria ricini</i> (Yoshii) Hansford, (Ellis, 1971)	Colonies amphigenous	-	Singly or in groups, erect, simple, straight or flexuous, almost cylindrical or rather thicker towards the base, septate, smooth, with 1 or a few conidial scars, pale brown, 5-10 trans. septa several longi. or obliq. septa, 80 ×5-9	Solitary or occasionally in chains of 2, straight or curved, obclavate or ellipsoidal, tapering rather abruptly to a very narrow beak which is equal in length to or up to twice as long as the body,  beak simple, pale to mid golden brown or reddish brown, 5-10 trans. and several longi. or obliq. septa, sometimes constricted at the septa,  pale, with beak 70-170 (140) × 13-27 (19)

				1-1.5
<i>Alternaria pedilanthii</i> sp.nov.	Well developed superficial, dark brown, 100µm	Well developed superficial, dark brown, 100µm.	Caespitose in dense fascicles, sometimes solitary, mostly arising from stroma, erect, straight to flexuous geniculate, smooth, branched, thick walled, conidio genous cells integrated, terminal, sympodial, polytretic, cicatrized with 1 or a few conidial scars, mid oliv. 2-6 trans. septa, 10-82.5× 4-8	Solitary, straight or curved, obclavate, ellipsoidal, thick walled, smooth, dictyosporic mostly constricted at the septa, conidial tips are long narrow & sometimes even curved like hook, apices obtuse, base obconicotruncate to subtruncate to rounded, hila thickened to unthickend, beak simple, mid to dark oliv. up to 7 trans. septa, up to 2 longi. & up to 2 obliq. & septa,  mid oliv., with beak 16.5-148×7-26.5  3-4.5

***Alternaria apicearum* S. Parihar et A.N. Rai sp.nov.(Fig-2.)**

Maculae amphigenosae, parvae vel magnae, coalescentes inititate apo margoinis, interdum necroticae, brunnea cum tenuibus, distinctae terminusi. Coloniae epiphyllosae, confinedae ad maculoare, fuscae brunnea. Mycelium hypharum immersum vel superficiale, angustum, laevia, ramosum, septata, medio olivaceo brunnea. Stroma bene formata, immersum vel superficiale, irregulares, pseudoparenchymatosa, fusco brunnea. Conidiophora caespitosa in parvae fasciculis, macronematosa, mononematosa, septata, eramosum, erecta vel suberacta, recta vel flexuosa, geniculata, laevia, medio olivacea brunnea, usque 7 transversae septata, 16.5–115x5-7µm. Cellulae conidiogenosae, incorporatae, terminales, sympodiales, polytreticae, cicatrices. Conidia solitaria, simplicia, recta vel curvata, obclavata, ellipsoideusa, tenuibus parietibus, laevia, dictyosporusa, cum 2 vel 8 transversae septata, 0 vel 1 oblquosa septata, pleraeque colligatioonis ed septata, medio vel fusco olivacea, apicem obtusa, basim roundata, pleraeque hilo incrassato, 18-64x8-15µm. Rostrum simplicia, brevis, 7-26x3-7µm. Fig.-2.

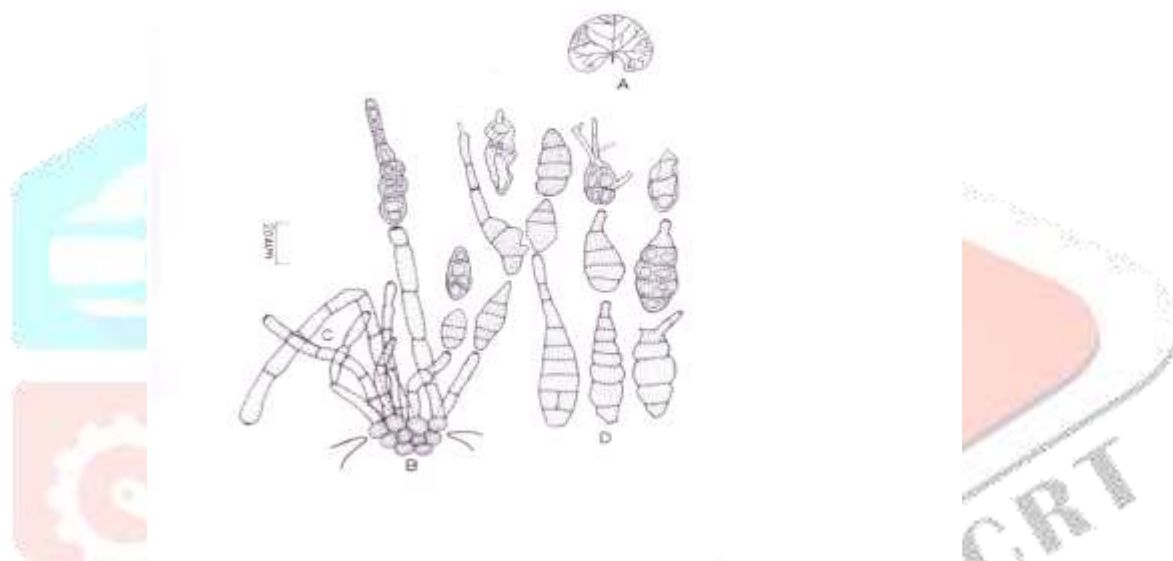
In foliis vivis *Centella asiatica* (L.) Urban. (Apiaceae), Oct. 2004, Botancial Garden, University Sagar, M.P. India, leg. S. Parihar, S.U. Herb No. SRR-220 holotypus HCIO No. 46,491.

Lesions amphigenous, small to large, coalescing initiate from margin, sometimes necrotic, brown with thick, distinct boundry. Colonies epiphylous, confined to the spots, blackish brown. Mycelium of hyphae immersed to superficial, narrow, smooth, branched, septate, mid olivaceous brown. Stromata well developed, immersed to superficial, irregular, pseudoparenchymatous, dark brown. Conidiophores, caespitose in small fascicles, macronematous, mononematous, septate, unbranched, erect to suberect, straight to flexuous, geniculate, smooth, mid olivaceous brown, upto 7 transversely septate, 16.5–115x5-7µm. Conidiogenous cells integrated, terminal, sympodial, polytretic, ciatrized. Conidia solitary, simple, straight or curved, obclavate, ellipsoidal, thick walled, smooth, dictyosporic, with 2 to 8 transversely septate, 0 to 1 oblique septa, mostly constricted at the septa, mid to dark olivaceous, apices obtuse, bases rounded, mostly thickened hila, 18-64 X 8-15µm. Beak simple, short, 7-26 X 3-7µm.Fig.-2.

**Material examined:**

On living leaves of *Centella asiatica* (L.) Urban. (Apiaceae), Oct. 2004, Botanical Garden, University, Sagar, M.P., India, leg. S Parihar, S.U. Herb. No. SRR-220 holotype HCIO No. 46,491

The present species has been compared with description and illustration of closely related species of *Alternaria* such as *A.cinerariae* Hori & Enjoji (Ellis,1971) and *A.sonchi* Davis (Ellis, 1971), (Table-2). A critical look to the table reveals that the species in question is altogether different from all others in having very clear symptoms, presence of well developed stroma, unbranched conidiophores having conidia with smaller dimensions as against the species given in table. The tabular data show that the proposed taxon is in no way be accommodated with any earlier described species and demands its rank as new species of *Alternaria*.



**Fig-2: *Alternaria apicearum* S. Parihar et A.N. Rai sp. nov.** A- Symptom B- Stroma C- Conidiophores D- Conidia

Table 2 : Comparative account of *Alternaria apicearum* sp. nov. with related species

<i>Altrania</i> spp.	Spots & Colonies	Stroma	Conidiophores	Conidia
<i>A. cinerariae</i> Hori & Enjoji (Ellis, 1976)	Effuse, mid to dark oliv. brown	-	Smooth, pale to mid oliv. brown, 150 × 5-8	Often in short chain, obpyriform to obclavate rostrate, smooth, constricted at the septa, golden brown 3-10 trans. septa several longi. septa, 50-140 × 15-40 beak 80 × 6-9
<i>A.sonchi</i> Davis Elliott. (Ellis, 1971)	Colonies amphigenous	-	Solitary or in groups, straight or flexuous, sometimes geniculate, septate, with 1 or several conidial scars, Pale to mid pale oliv. brown or brown, 80×5- 9	Solitary or sometimes in very short chains, straight or curved, obclavate or conical with a rather short, fat beak, broadly rounded at the base, smooth or minutely verruculose often constricted at the septa Beak wide, tapering, mid pale to mid golden brown or oliv. brown 4-8

				trans. & 0 or a few longi. & obliq. septa, 60-130(77)x15-26(20)
				beak 4-10
<i>A. apiacearum</i> sp. nov.	Colonies epiphyllous, confined to the spot, blackish brown	Well developed, immersed to superficial, irregular, pseudoparenchymat-ous, dark brown	Solitary, caespitose in small fascicles, macronematous, mononematous, septate, unbranched, erect to suberect, straight to, sometimes flexuous, geniculate, smooth, mid oliv. brown, 7 trans. septa, 16.5-115x5-7	Solitary or sometimes in very short chains straight or curved obclavate, ellipsoidal, thick walled, smooth, dictyosporic,  Beak simple, short, mid oliv. to dark oliv. 2-8 trans. & 0 or a few longi. & obliq. Septa, 18-64x8-15
				beak 7-26 × 3-7

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