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RESEARCH ARTICLE

The detection of a new species of fungus genus *Corynespora* Gussow on the Medicinal plants *Cryptostegia grandiflora* R.Br.

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Abstract

During frequent surveys for phytoparasitic foliicolous microfungi, interesting specimens were collected from Department of Botany, Dr. H. S. Gour University, Sagar M.P. and Betul forest division of Madhya Pradesh, which upon detailed examination proved to be undescribed fungal taxon of hyphomycetes, *Corynespora cryptostegiae* sp.nov. infecting the leaves of *Cryptostegia grandiflora* R.Br. (Asclepiadaceae) respectively. These have been compared with their allied taxa for showing their distinct identity.

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Introduction:

Medicinal plants are widely using for treatment of many kind of human disease all over the world. According to the world health organization's report, about 80% of the world populations are taking interest in indigenous medicinal plants. *Cryptostegia grandiflora* (Roxb.) R. Br. (Family: Asclepiadaceae) is widely distributed throughout tropical Africa, Madagascar and some parts of India [01, 02]. The juice of aerial parts of *C. grandiflora* are reported to, produce caoutchoue when exposed to sunshine [03]. It is also reported that this plant decoction is consumed to treat nervous disorders [04]. This plant species is also reported to possess various biological activities like antioxidant [05], antitumour [06] antiviral [07] and control the schistosomiasis [08]. The aqueous solution of ethanol extract of aerial parts [09, 10] and the latex derived from this plant have proteolytic, bacteriolytic activity and possess relevant enzymatic activities against pathogenic related proteins [11, 12]. Rigorous literature survey revealed that there are no reports available regarding analgesic property of *C. grandiflora*, hence the present study was undertaken to evaluate the analgesic activity of the leaf methanol extract (LME) of *C. grandiflora* to substantiate its traditional claims as decoction to treat nervous disorders through scientific evaluations. *C. grandiflora* is a toxic vine, and though it is a toxic plant, the leaf decoction of this plant is consumed to treat various nervous disorders and wound healing [13].

The preliminary phytochemical screening revealed the presence of alkaloids, glycosides, flavonoids, steroids, saponins, tannin and phenolic compounds. Many investigators have reported the actions of secondary metabolites such as flavonoids and alkaloids played a major role in analgesic activity [14, 15]. The presence of secondary metabolites like saponins, flavonoids, tannins, and terpenoides may be attributed for analgesic activity [16]. However, alkaloids are well known for their ability to inhibit pain perception [17, 18], whereas flavonoids are

primarily targeting prostaglandin synthesis involved in pain perception, indicating that flavonoid components of the plant extract might be responsible for analgesic property of the extract [19,20,21].

In the present study, analgesic activity of LME of *C. grandiflora* was evaluated by using acetic acid induced abdominal writhing and tail flick method in mice. In acetic acid induced experiment, animal models react with unique abdominal stretching behaviour which is called writhing. The reduction in abdominal writhing indicates the percentage levels of analgesia in the acetic acid writhing reflex model [22] in which the pain is due to the release of free arachidonic acid from phospholipid tissue [23] via, cyclooxygenase (COX) and prostaglandin biosynthesis [24]. The acetic acid induced writhing response is a sensitive procedure to evaluate peripherally acting analgesics and the response is thought to be mediated by peritoneal mast cells [25], acid sensing ion channels [26] and the prostaglandin pathways [27]. Prostaglandins E2 and F2 α are reported to be increased in the peritoneal fluid of mice due to administration of acetic acid, this could be produced by neutrophil polynuclear cells but also by destruction of macrophages [28, 29]. The significant pain reduction of LME might be due to the presence of alkaloids and flavonoids analgesic principles acting against the prostaglandin pathways.

The centrally acting analgesics generally raise the pain threshold of mice towards heat [30]. The thermal induced nociceptive tests are more sensitive to opioid receptors and non-thermal tests are sensitive to κ -opioid receptors as they are G-protein-coupled receptors (GPCRs) [31, 32, 33]. The narcotic analgesics inhibit both peripheral and central mechanism of pain, while nonsteroidal anti-inflammatory /analgesics agents (NSAIDs) inhibit only peripheral pain [34, 35]. The inhibition of pain could take place not only from the presence of opioids and/or opiodiomimetics but also from bio-active compounds and secondary metabolites like phenolic and steroidal constituents [36, 37]. The present study revealed that the leaf methanol extract of *C. grandiflora* exhibited significant analgesic property but less effective [38].

Method: Survey of fungal specimens from selected forest area, Collection of the fungal infected plants, leaves and their parts, Study of symptomatology, Slide preparation (by scrap, mount and thin hand cut section) and microscopic investigation.

Mycotaxonomic Study of Plant leaf fungi:

***Corynespora* Gussow (1906) Z. PflKrankh., 76: 10-13.**

Corynespora cryptostegiae sp.nov. (Plate 1, Fig. 1)

Laesiones amphigenae, parva magnis, suborbiculatum irregulares, pallide centribus cinereus, cum laete brunnea marginis. Coloniae amphiphyllos, praedominantibus epiphyllis, effusae, cinereo aut brunnea. Mycelium hypharum immersum, septatae, ramosae, hyalinae. Stroma nil, setae et hyphopodia absentare. Conidiophora macronemata, solitariae, erectae, simplices, rectae vel flexuosi, laeves ad undulatis margine, quidam sunt successive angustiori ad apicem, percurrans usque quindecim successiva proliferationes, conidiophora angusto in sulum multiplicatio, bulbosus, basim pluriseptate, olivaceo usque brunneis, 140-230.5x2.7-5.5 μ m. Cellulae conidiogenae monotretic, integrated, terminale, percurrans, cylindratis. Conidia plerumque solitariis quandoque catenis, acrogenous, obclavate, cylindratis, ovalibus, tubulosae, recta vel curvata, hyalinis usque pallide olivaceo ad brunneis, laevibus ad verruculosus, 0-28 pseudoseptate, paucis conidia arcte pseudoseptate, apice subcutis usque obtusos obconicotruncate ad basis, hylum atrobunneis vel subhyalinis, 20-135.5x4-19.5 μ m.

Lesions amphigenous, small to large, suborbicular to irregular, pale to grey centre, with a light brown margin. Colonies amphiphillous, predominantly epiphyllous, effuse, grey or brown. Mycelium of hyphae immersed,

ptate, branched, hyaline. Stroma nil, setae and hyphopodia absent. Conidiophores macronematous, solitary, erect, simple, straight or flexuous, smooth to wavy margin, some are successively narrower towards apex, percurrent, up to fifteen successive proliferations, conidiophores narrow on each proliferation, bulbous at the base, pluriseptate, olivaceous to brown, 140- 230.5x2.7-5.5 μm . Conidiogenous cells monotretic, integrated, terminal, percurrent, and cylindrical. Conidia mostly solitary sometimes catenate, acrogenous, obclavate, cylindrical, oval, tubular, straight to curved, hyaline to pale olivaceous to brown, smooth to verruculose, 0-28 pseudoseptate, a few conidia are closely pseudoseptate, apex subacute to obtuse, obconicotruncate at the base, hilum dark or subhyaline, 20-135.5x4-19.5 μm .

Survey:

On living leaves of *Cryptostegia grandiflora* R.Br. (Asclepiadaceae), September 2009, Betul Bhainsdehi South Forest Division, Madhya Pradesh, India, leg. R.S. THAKUR S.U. Herb No. RS-BOT-529-627 Holotype, HCIO Isotype 51462.

Result & Discussion:

The present study is based only on plant fungal research, their authors are described a new fungal species on the medicinal importance plant so, the plant profile and phytochemical analysis also included only take intention, which property discrete by causal fungal organisms. There we are deducted kind of infecting parasite and give a particular position in the fungal kingdom.

A detailed foliicolous study of the literature on fungus genus *Corynespora* revealed that *C. asclepiadiacarum* **Dubey and Rai** (2003) stromatic species and *C. cassiicola* (Berk. & Curtis), Ellis, (1971) astromatic species are described on the host family (Asclepiadaceae) and hence compared with the author's collection (Table 4). It is gathered from the tabular data that the proposed taxon is drastically dissimilar in having variation in structure and size of conidiophore and conidia, geniculate conidiophores and longer conidia. Therefore, it has been proposed to dispose it as a new species.

Table 01: Comparative account of *Corynespora cryptostegiae* sp. nov. with allied taxa.

Species	Colonies/spot	Stromata	Conidiophores			Conidia		
			Structure	Colour & Septation	Size (in μm)	Structure	Colour & Septation	Size (in μm)
<i>C. asclepiadiacarum</i> [39] Dubey and Rai (2003).	Amphigenous, red brown on upper, smoky on lower surface, spots mostly surrounded by brownish haloes, epiphilous confined to the central portion, blakish brown or black spots.	Well developed, up to 44 μm diam.	Solitary erect to suberect, (rarely sometime branched at the apex dichotomously) smooth, terminal, conidiogenous cells percurrently proliferation.	Mid olivaceous, up to 18 septa.	48-220 x 8-16.	Solitary constricted like the chain, obclavate-cylindrical to cylindric, rarely clavate, some-times germinating, few guttulate apices, subacute to obtuse, base truncate to subtruncate with unthickend hilum.	Up to 26 pseudo-septate.	44-192 x 10-25.5.

<i>C. cassicola</i> [40] (Berk. & Curtis) Ellis, 1971.	Effuse, grey or brown, thinly hairy, viewed under a binocular dissecting microscope the conidiophores appear iridescent. Mycelium mostly immersed.	None.	Erect, simple or occasionally branched, straight or slightly flexuous, smooth, septate, monotretic, percurrent, with up to nine successive cylindrical proliferations.	Pale to mid brown.	110 - 850 x 4-11.	Solitary or catenate, very variable in shape, obclavate to cylindrical, straight or curved, smooth, truncate base, 4-8 µm wide.	Subhyaline to rather pale olivaceous brown, 4-20 pseudo-septate.	40-220 x 9-22.
<i>C. cryptostegiae</i> (Proposed taxon).	Lesions amphigenous, small to large, suborbicular to irregular, pale to grey centre, with a light brown margin, amphiphylous, predominantly epiphylous, effuse, grey or brown. Mycelium of hyphae immersed, septate, branched, hyaline.	None.	Macronematous, solitary, erect, simple, straight or flexuous, smooth to wavy margin, some are successively narrower towards apex, percurrent, up to fifteen successive proliferations.	Olivaceous to brown.	140-230. 5x2. 7-5.5.	Mostly solitary sometimes catenate, acrogenous, obclavate, cylindrical, oval, tubular, straight to curved, smooth to verruculose, apex subacute to obtuse, obconico-truncate at the base.	Hyaline to pale olivaceous brown, 0-28 pseudo-septate.	20-135.5 x4-19.5.

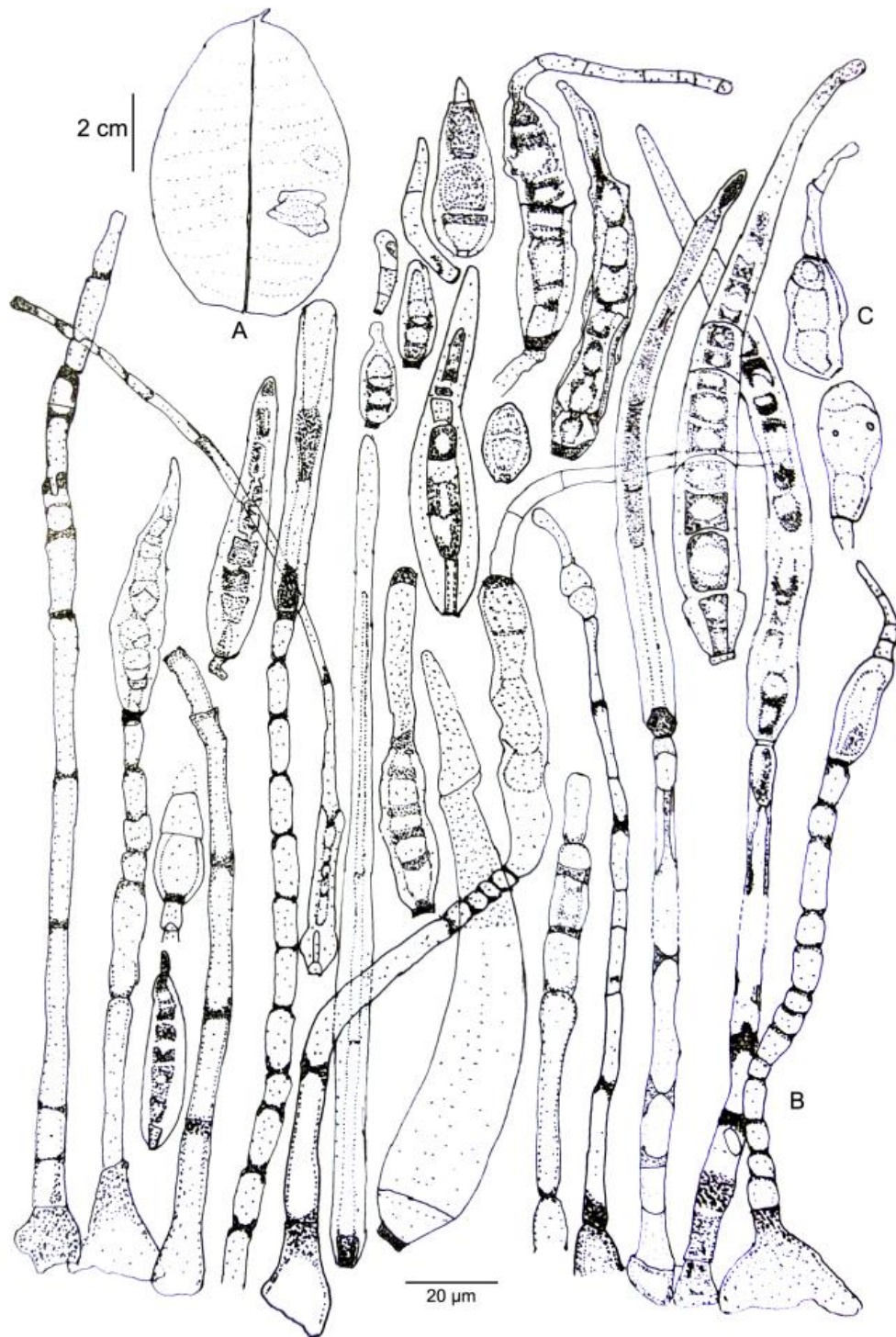
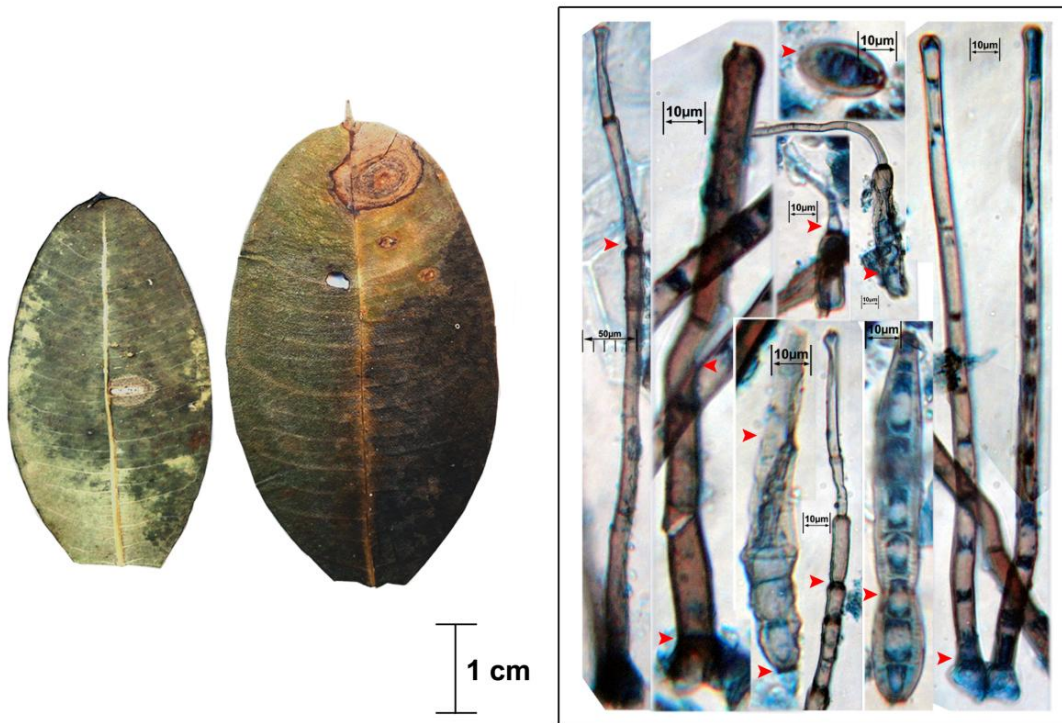
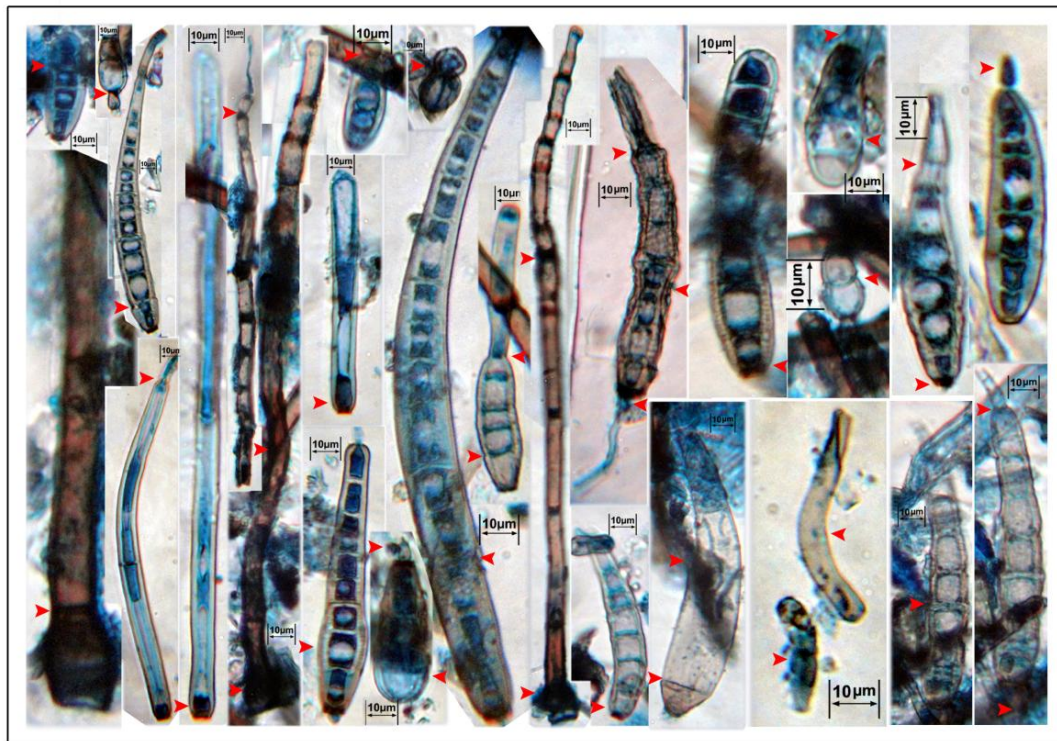


Figure 01: *Corynespora cryptostegiae* sp. nov.
A. Symptom, B. Conidiophores (X500) & C. Conidia (X500)



(A)

(B)



(C)

Plate 01: *Corynespora cryptostegiae* sp. nov.
A. Symptom, B. & C. Conidiophores (X500) & Conidia (X500).

Aknowlegement:

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