of the lemma and palea to open up may be due to the malfunctioning of the lodicules, which bring about this process in grass florets[15]. Moreover, we noticed that when the climatic conditions were favourable, honey bees visited the florets and collected pollen, at the time of anthesis (anther dehiscence and pollen release).

By acetocarmine staining the pollen grains looked fertile. However, when *in vitro* pollen germination was attempted using a wide range of sugars, the pollen did not germinate. Earlier, pollen of two other species of bamboos (*Bambusa arundinacea* and *Dendrocalamus strictus*) readily germinated in modifications of Brewbaker and Kwak's[16] medium containing 1% sucrose and 1% glucose respectively[17–19]. This indicates non-viability of pollen in this bamboo. Non-viability of pollen may also be one of the reasons for the absence of seed-set as suggested by Koshy and Pushpangadan[4]. We also conducted some preliminary experiments on anther culture. Though the anthers did not respond, some ovules developed. This again indirectly points towards non-viability of pollen grains. Reason/s for the non-viability of pollen may throw some light on the evolution of this bamboo.

Interestingly there is one more report of flowering in two clumps of '*Bambusa vulgaris*' from Kona side of the Big Island of Hawaii[20].

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Risk potential of a biocontrol agent unmasked

Recent awareness on the ill-effects of indiscriminate use of synthetic fungicides has resulted in the search for alternate eco-friendly methods of plant disease control. One option actively being adopted is biological control with antagonistic organisms. *Sclerotium rolfsii*, a devastating polyphagus soil-borne plant pathogen, is effectively managed through a number of biocontrol agents such as some fungi and bacteria. *Bacillus subtilis* produces a host of antibiotics which effectively control *S. rolfsii*. Much emphasis is given on the use of this bacterium due to its superb survival competence over a wide range of conditions through the formation of resistant endospores[1]. However, our observations show that despite effective control of the vegetative growth of *S. rolfsii*, *B. subtilis* induced sexual reproduction in this fungus, a hitherto unreported phenomenon with varying implications.

In our routine tests of the antagonistic potential of a number of bacteria against *S. rolfsii* on potato dextrose agar (peeled potato 250 g; dextrose 20 g; distilled water 1000 ml) medium at 25 ± 2°C, an isolate of *B. subtilis* showed promising antagonistic activity on the mycelial growth of the pathogen and checked sclerotium formation (Figure 1 *a*). However, on prolonged incubation (10–12 days), hyphal growth characteristically different from the normal fluffy growth was observed which varied in dimension and branching habit (Figure 1 arrow) and eventually thin hyphae grew further bearing hymenia with fertile basidia, each with four sterigmata and basidiospores (Figure 1 *b*). Further study revealed that the presence of sugar is an essential requirement for the antagonism and induction of sexual reproduction by *B. subtilis*. Depletion of dextrose in the medium inhibited antagonistic activity and sexual stage formation. However, this effect was reverted following addition of 5 g dextrose (optimum being 20 g per 1) in the medium. The frequency of sexual state formation in *S. rolfsii* by *B. subtilis* was 20–30%.

Our observation of this phenomenon has the following implications: (i) The native population of *B. subtilis* in the soil may have a direct role on the genetic recombination of *S. rolfsii* through the induction of sexual reproduction.

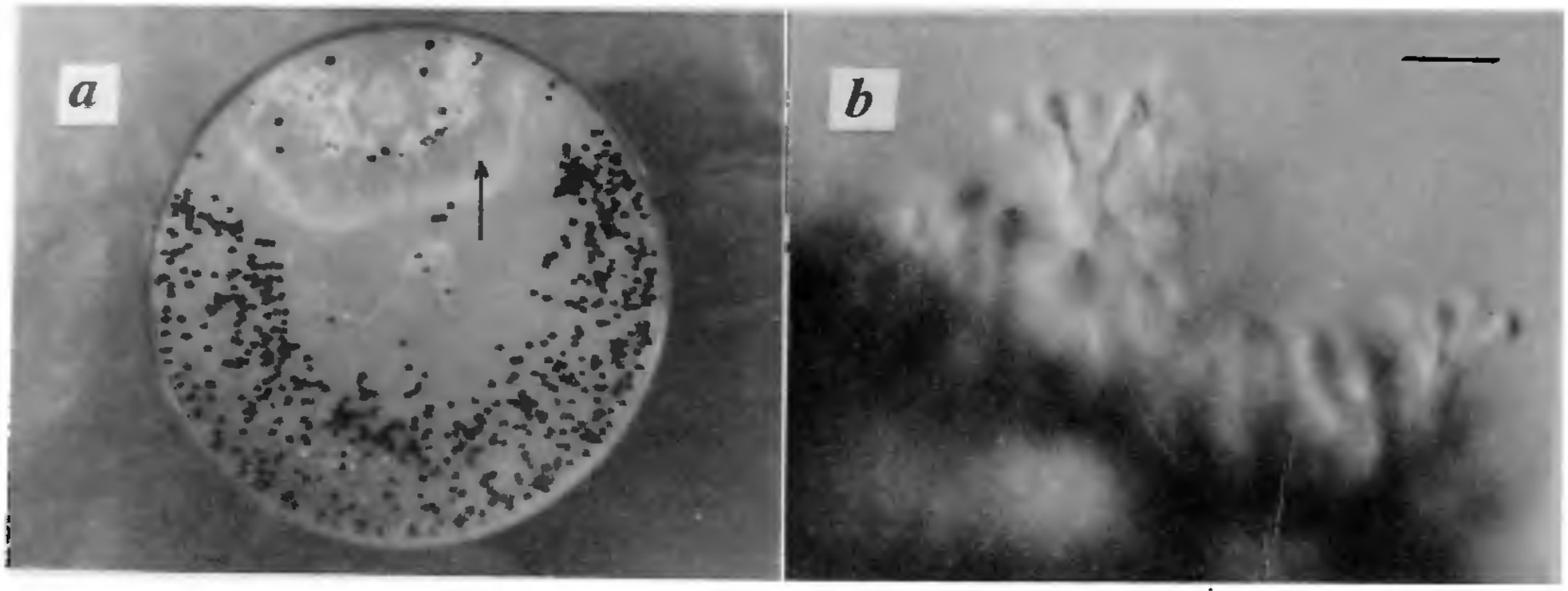

Figure 1. *a*, Abundant hymenium formation around *Bacillus subtilis* colony. *b*, Hymenium with basidia, each bearing four basidiospores. (Bar = 10 μm)

This is in addition to the role of *Cyperus rotundus* reported earlier[2]. (ii) The metabolites of *B. subtilis*, although effective against vegetative growth of *S. rolfsii*, do not have any effect on its sexual stage. (iii) More importantly, this observation questions the wisdom of the use of such biocontrol agents for plant disease control as it may lead to the creation of a wide genetic variability in pathogens with unpredictable results as seen in the case of *Phytophthora infestans* where oospores were induced by *Trichoderma viride*, a potential biocontrol agent[3]. The two types of hyphae, one responsible for sexual reproduction and the other for vegetative growth in *S. rolfsii* following treatment with *B. subtilis*, are being reported for the first time. *B. subtilis* may help in elucidating reasons(s) for cellular differentiation in *S. rolfsii*. This is the first report of such an interaction between a fungus and a bacterium.

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Chemical ecology of certain tropical fruit pulp

It is well known that the fruit pulps of many tree species contain inhibitors/stimulators of germination[1]. This makes sense in the ecological perspective, for, such inhibitors would not only prevent premature germination of seeds in the fruit still on the tree but also of those dropped from the tree and lying below. Delayed germination should be in the interest of the tree because zoochoric agents (birds, mammals, etc.) can remove the inhibitors through their alimentary canal while dispersing seeds to distant points[2]. It is therefore expected that natural selection should favour metabolism of germination inhibitory substances and of nutrients for zoochoric agents. It is thus of interest to study the germination-inhibitors of relatively little known tropical species. Our investigations have revealed not only the inhibitors but also, unexpectedly, stimulators in the pulp. These substances seem to occur even when, theoretically, their presence is not necessary.

Bird dispersal of *Ficus bengalensis* seeds has been reported[3]. After establishing that germination of *F. bengalensis* seeds is absolutely inhibited in presence of the pulp, aqueous extract of the latter was also found to be strongly inhibitory (Brahmachary and Midya, unpublished). Preliminary experiments suggested that such an extract also strongly inhibits monocots (standard rice grains).

To understand the inhibitory action, 10 g of pulp was macerated in 10 ml water, centrifuged, filtered and recentrifuged and the supernatant solution (stock 1) was taken. 40 standard rice grains (with practically cent per cent germination) were used in each assay set. Stock 1 exerted 100% inhibitory effect while dilutions (2, 4, 8 and 16 times) caused lesser and lesser inhibition.

Through paper chromatography it was found that the aqueous extract contained inhibitory substances in the form of phenolics as well as unknown stimulators (Brahmachary, unpublished).

One of the ecological scaffoldings in Namibia is the Kameeldoring or Camel thorn, *Acacia erioloba*. The large heavy pods drop under the tree and seed dispersal is possible only through zoochoric agents: wild animals such as the elephant, kudu (antelope) and