sterilized petridishes to a depth of 3 to 5 mm or on to glass slides to about 2 to 4 mm thickness making sure to spread evenly. Inoculation of pollen was done by dusting the dehisced anthers onto the surface of the medium with the help of a camel hair brush. Precautions were taken to avoid clumping of the pollens. Inoculated plates and slides were placed in a germination chamber at room temperature ($28 \pm 2°C$) and relative humidity above 70%. Germination percentages were calculated by making counts of all germinated and ungerminated grains in each of 3 to 4 random microscopic fields. Three replications were maintained each one consisting of at least 100 pollen grains per petri plate or slide. Cotton blue (Lobachemie, India) 1% was added which helped in the staining of pollen tubes. Diameter of the pollen grains and length of the pollen tubes were measured with the help of ocular and stage micrometers.

After investigating many combinations of ingredients consistent germination of cotton as well as okra pollen grains (*in vitro*) was observed (figure 1A–D) in a medium comprising of 25% sucrose, 0.07% $MnSO_4$ and 0.04% each of $Ca(NO_3)_2$ and H_3BO_3 in liquid medium with the addition of 3% agar in solid medium. Germination began within minutes after contact with the medium and was completed within an hour of inoculation. An average of 90% germination was noticed in cotton as well as okra pollen while Taylor[2] reported an average of only 30% germination in *G. hirsutum*. However, Barrow[5] succeeded in obtaining 98% germination employing hanging droplet method. The main differences between Taylor's and Barrow's methods and the present one are (1) instead of 3.5 g of agar/100 ml water, 3% agar was found better; (2) freshly plated agar medium was better than aged ones (24 to 48 hours) for rapid and better germination, no sinking or bursting of pollen was noticed; (3) unlike the hanging droplet method on Rodac plate, we used plain glass slides as well as petriplates, where the spread of the pollen grains were more uniform making it less cumbersome for measurements. Thus the method described here is not only much easier, but also brings about rapid and consistent germination of pollen *in vitro*. Among the two methods tried, germination in agar based medium brought about straight pollen tubes while in the liquid medium the pollen tubes were much longer but highly coiled (figure 1B, C).

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ICERYA AEGYPTIACA (DOUGLAS) A NEW PEST OF MULBERRY (*MORUS ALBA* LINN.) IN INDIA AND ITS CONTROL

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PRODUCTION of high quality mulberry leaves is the primary consideration in rearing silkworms (*Bombyx mori* Linn.) and production of cocoons of high standards. Mulberry being a perennial crop is infested by a variety of pests. Among sucking insect pests, the common mealy bug *viz Maconellicoccus hirsutus* has been incriminated with spread of 'Tukra disease' of mulberry in West-Bengal[3]. Feeding on sap of mulberry by *Icerya purchasi* has been reported from Burma[1]. During survey in October 1983 and 1984, it was observed that mulberry (M-5) leaves were infested by another mealy bug *viz*, *Icerya aegyptiaca* (Douglas) (Homoptera; Margarodidae) causing severe damage to mulberry gardens in Bangalore north area and at G.K.V.K. Campus and *I. purchasi* Maskell on shoots of mulberry at Hebbal Campus of University of Agricultural Sciences, Bangalore. However, *I. aegyptiaca* was also reported on Areca inflorescence, Jack and different varieties of croton[2] from Karnataka and on *Morus alba* in the Phillippines and Palestine from the other parts of the world[4]. On mulberry *I. aegyptiaca* was found congregating along mid-rib and veins underneath the mulberry leaves (figure 1). As a result of draining up of the sap continuously the vigour as well as quality of leaves from the infested plants was reduced and growth stunted. The infested leaves became green and put forth slight upward curling. The mealy bugs were attended by a species of black ant persistently.

Occasionally *I. purchasi* was also found to infest mulberry shoots solitarily in May 1983 and it colonized well by November 1983. The largest colony on the shoot was 70 cm length with a thick encrustation with mostly sedentary forms around mulberry branch.

Figure 1 Mulberry leaves infested by *Icerya aegyptica* and also showing pupa of *Scymnus*. sp. (a).

Besides, black sooty-mould on leaves below in line of the infested shoot interfering with photosynthetic activity of mulberry leaves, all the dormant budwood on the infested shoot was killed leaving only terminal reduced leaves, thus affecting leaf production and rendering the shoot to become unfit for planting.

The crawlers and sedentary forms of *I. aegyptiaca* were found prayed upon by both the grubs and adults of *scymnus* (*Pullus*) sp., while *I. purchasi* by *Rodolia breviuscula* (Coleoptera: Coccinellidae). The predators also persisted breeding in the hosts colony. *Scymnus* sp., breed on lower surface of leaves close to colonies of the mealy bug (figure 1a). A maximum of five-pupae per infested leaf was observed in May 1984 and the plants were disinfested completely by the predators.

The study indicates that *I. aegyptiaca* now recorded on mulberry has great destructive potentialities as it is expanding the host range.

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SCHIZOPHYLLUM COMMUNE Fr.-FIRST RECORD FROM INDIA ON STEM BLEEDING AFFECTED COCONUT PALM

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THE incidence of stem bleeding disease was first reported from Sri Lanka and subsequently from India, the Philippines, Malaysia, Andamans and Trinidad[1].

The characteristic symptom of this disease of the coconut palm is the exudation of a dark reddish brown fluid from the cracks on the trunk portion of the palm. The etiology of the disease has not been conclusively proved so far.

While studying the fungi associated with the disease affected palms located at Kandalloor (Alleppey district, Kerala) a constant association of *Phomopsis cocoina* (Cooke) Punith. was observed in the stem tissue[2]. In addition to this a basidiomycete fungus with fructification was also isolated from the roots, infected stem and apparently healthy stem tissue away from the bleeding patches of about 60% of the palms studied.

The basidiomycete isolated from the stem bleeding affected palms was sent to the Forest Research Institute, Dehra Dun and got identified as *Schizophyllum commune* Fr. This fungus was noticed in coconut[3] quite some time back.

The world wide distribution of *S. commune* as a virulent wood-rotting fungus in forest trees is well known[4-6]. It is also reported that *S. commune* is associated with diseases like heart rot in apple, cherry, plum, bark diseases in peach trees and stem necrosis on young poplar trees[7,8]. Stem rot disease of apple associated with *S. commune* reported from Bangalore[9] was characterized by cankers on the main stem and branches, often accompanied with a dark brown exudation. The symptom of exudation of dark brown fluid described in apple trees appears to have some resemblance to the stem bleeding disease in coconut. Studies to ascertain the possible role of *P. cocoina* and *S. commune* in the causation of stem bleeding disease are in progress.

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