Such a phenomenon has been reported from Bangladesh, where people promote higher (40%) fruit-yielding trees for family consumption and are not dependent on home-gardens for firewood[23].

Our study has revealed that the species found in the agro-ecosystems are similar to those found in adjacent forests, indicating the willingness of the farmers to mimic the natural forests in their agro-ecosystems. Thus it is appropriate to consider local community as an integral part of ecosystem function for effectively managing agro-ecosystems in the tropics, with a concern of biodiversity. Although this study analyses tree diversity and end uses of tree species in different locations in Sirsimakki village ecosystem, many questions concerning agro-ecosystems have to be answered to understand the suitability of species in different land uses of the village ecosystem. Some of these aspects to be studied include influence of forest trees on horticultural crops, lopping methods, contribution of these trees for nutrient cycling and determination of tree crop/field crop combination.

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Basidiocarp production in *Agaricus heterocystis* Heinem. and Gooss. in nutrient agar media

The genus *Agaricus* consists of many well-tried edible species. The comprehensively studied and most widely used commercial species is *Agaricus bisporus* (J. Lange) Imbach[1]. Other edible mushrooms which are cultivated on a commercial basis include *Flammulina velutipes*, *Lentinula edodes*, *Pleurotus ostreatus* and *Volvariella volvacea*. A thorough knowledge of the eco-physiology of basidiocarp formation of these mushrooms would be of immense value[2]. This is possible by controlling 'fruiting' of these fungi in axenic culture. But getting most of these edible fungi to 'fruit' in axenic culture is a difficult task, although non-edible fungi, like species of *Coprinus* and *Schizophyllum commune* have been made to 'fruit' in axenic culture with ease[2]. This is a report of *Agaricus heterocystis* Heinem. and Gooss. producing fully mature basidiocarp in nutrient agar medium. This is of considerable importance keeping in mind that many species of *Agaricus* are edible.

The culture of *A. heterocystis* used in the present study was isolated from basidiocarps collected at the Guindy Campus of the University of Madras, Chennai. Pure culture of this species was made and subsequently maintained on potato dextrose agar (PDA) medium. This fungus has not been isolated as pure culture earlier. Production of basidiocarps in different media, viz. PDA, potato sucrose agar (PSA), malt extract agar (MEA), oat meal agar (OMA) and corn meal agar

Figure 1. Basidiocarp of *Agaricus heterocystis* in potato dextrose agar medium.

Figure 2. Basidiocarp production of *Agaricus heterocystis* in paddy straw compost in a tray.

Table 1. Basidiocarp formation of *Agaricus heterocystis* at 30°C in complete darkness in different media

Medium	No. of days for formation of mature basidiocarps (fruit-bodies)
PDA	12–14
PSA	13–15
OMA	14–17
CMA	Only primordia produced

(CMA) was studied. Eight millimetre discs, cut from the growing edge of the mycelium of *A. heterocystis* grown on petri plates containing PDA medium, were inoculated in 25 ml of the above-mentioned media contained in 100 ml Erlenmeyer flasks. The flasks were incubated in dark at 30°C. Another set of flasks with PDA medium was incubated under continuous light (1200 lux). All treatments were carried out in triplicates.

Fully mature basidiocarps (Figure 1) were produced in all the media used, under incubation temperature of 30°C and in complete darkness for 12–17 days after inoculation, excepting in the case of CMA medium where only primordia were produced (Table 1). Since the incubation condition was similar, the inability of *A. heterocystis* to form mature basidiocarps in CMA medium must be nutrition-related. Also, nutrition is known to influence basidiocarp formation in agarics[2–5]. Couvy[6] has shown that for several species of the genus *Agaricus*, including *A. bisporus*, light was not indispensable for basidiocarp formation. Many species, which were kept in total darkness, produced abnormal fruit-bodies along with normal ones. According to Manachere[2], in all the cases only a light regime of suitable duration and intensity at a particular stage of development allows normal morphogenesis. In the present study it was found that under continuous light treatment, mycelial growth of *A. heterocystis* was suppressed and subsequently fruit-bodies did not occur. The well-known, commercially-grown, white button-mushroom, *A. bisporus*, is a temperate species and normally produces basidiocarps in compost at less than 20°C. There is another species of *Agaricus*, *A. bitorquis* which is also commercially grown and is known to have strains which can grow and produce fruit-bodies in compost at 30°C. This species was shown to form primordia and abnormal primordial basidiocarps in nutrient medium[7,8]. The present isolate of *A. heterocystis* produces normal fruit-bodies in different nutrient media in complete darkness at 30°C. This observation is significant since this strain can be used for various types of studies of basidiocarp morphogenesis which in turn will help in the commercial exploitation of this fungus for edible purposes. This strain of *A. heterocystis* was also found to produce fully grown fruit-bodies when inoculated in synthetic compost with paddy straw (Figure 2).

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