non-native plants and native insects interactions, as we do not have many empirical studies. The role of native insects, as herbivores and pollinators, in the control and spread of non-native plants on a regional scale is essential to understand and decipher how this interaction affects plant communities in the Indian subcontinent. Changes in insect communities on native and non-native plants could act as a tool in predicting invasiveness of non-natives and have implications for conservation of native biodiversity. It also emphasizes to integrate the role of non-native plants and native insects in understanding complexities of ecosystem functioning and dynamics. Trophic guilds comparisons, and identification of specialist insects on non-native plant species may help in understanding non-native plant invasiveness, and also for initiating control measures against potent invaders. The analysis advocates future studies and fund allocation towards research which focuses on insects and non-native plants interactions in a community.

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Time reduction for determination of infective propagule numbers of arbuscular mycorrhizal fungi by most probable number assay

It is now well documented that arbuscular mycorrhizal fungi (AMF) improve fitness and growth of plants which are important in agriculture, horticulture and forestry[1]. An important task in most AM studies is to determine accurately the number of infective propagules (IP) of AMF in soil, substrate, or inoculum. The most probable number (MPN) technique (or method of ultimate dilution)[2] for enumerating viable microorganisms, is a possible solution to the problems faced when using the usual methods of counting AMF endophyte propagules. Early microbiology frequently estimated population sizes on the basis of the highest dilution at which growth could be obtained. Thus, if growth was observed in a 10^{-4} but not in a 10^{-5} dilution, the number of viable cells was estimated to be between 10^4 and 10^5. It soon became evident that the testing of several aliquots from each of several successive dilutions, together with mathematical calculation, or interpolation, fostered much more precise estimations. The MPN technique is based on a determination of the presence or absence of microorganisms in several individual aliquots of each of several consecutive dilutions of soil or other material. A prerequisite of the method is that the AMF population to be determined must be easily recognized in the substrate. It is based on a series of soil dilutions where presence or absence of mycorrhizal colonization is recorded and the results given as a probability of the number of infective propagules based on a statistical table. Thus, the MPN method is recommended as most reliable to estimate the number of infective propagules of AMF in soil, substrate or inoculum. The number calculated has a 95% confidence level[2], but one of the disadvantages is that the set-up of the assay is time-consuming. Plants have to be grown for 45 days and then the roots collected for staining. This is because of larger containers of 7.5 cm diameter holding 300 g soil per pot and distributed in 5 replications for each dilution ranging from 10^{-1} to 10^{-4} or 10^{-5} as suggested by Porter[2]. Hence it was hypothesized that the period of 45 days of plant growth may be reduced by containing the substrate in smaller receptacles holding lesser quantity of soil/substrate.

PVC tubes 15 cm long with 3 different diameters (3.2, 2.5 and 1.9 cm) were used in the study. The substrate used was vermiculite (80%) mixed with 20% sterilized soil. Three different AMF species, viz. *Rhizophagus fasciculatus* (=*Glomus fasciculatum*), *Funneliformis mosseae* (=*Glomus mosseae*) and *Ambispora leptoticha* (=*Glomus leptotichum*) were maintained as pot cultures at Centre for Natural Biological Resources and Community Development, Bengaluru using Rhodes grass (*Chloris gayana*) as the host and vermiculite, perlite and soilrite in the ratio 1 : 1 : 1 (v/v/v) as the substrate. Each mycorrhizal inoculum (25 g) was removed to a plastic bag, 225 g of diluent (vermiculite 80% + sterilized soil 20%) added, and thoroughly shaken to obtain a dilution of 10^{-1}. Similarly, dilutions up to 10^{-4} were prepared. The

Table 1. Influence of PVC tubes of different diameters on infective propagule numbers AMF

AMF	Diameter of PVC tubes (cm)	No. of infective propagules g^{-1}
Rhizophagus fasciculatus	3.2	1800
	2.5	1700
	1.9	1400
Funneliformis mosseae	3.2	1700
	2.5	1400
	1.9	1400
Ambispora leptoticha	3.2	1800
	2.5	1400
	1.9	1400

substrate from each dilution was added to PVC tubes of the three different diameters. Five replicate tubes for each dilution were prepared. Finger millet (*Eleusine coracana*) seeds were sown in each tube and plants were maintained in a glasshouse and watered whenever necessary. Plants (all 60 replicates) were harvested 25 days after sowing (DAS). Roots were washed free from soil and stained with Trypan blue[3]. Using a dissection microscope, presence or absence of mycorrhizal colonization was determined in each replicate. Counts of positive tubes (those containing mycorrhiza) in different dilutions were used to calculate MPN values using the table by Alexander[4].

Table 1 presents IP data of the three AMF determined in PVC tubes of different diameters. The results show that IP is slightly higher when determined in 3.2 cm dia. PVC tubes in all three AMF tested, the IP number per gram being 1800, 1700 and 1800 for *R. fasciculatus*, *F. mosseae* and *A. leptoticha* respectively. In 2.5 cm dia tubes, the IP number per gram was 1700, 1400 and 1400 respectively for *R. fasciculatus*, *F. mosseae* and *A. leptoticha.* In 1.9 cm dia. tubes, the IP number per gram was 1400 for all three AMF. Earlier studies have shown that to attain significant plant growth response, the IP required is 1562 g^{-1} (ref. 5). The present study also indicated that the minimum value required to initiate root colonization is 3 IP g^{-1}. The Fertilizer Control Order of India (amended up to 2015), which gives the specification of biofertilizer quality has prescribed 1200 IP g^{-1} as the quality standard for AMF[6].

From the results of the present study it can be concluded that for determination of IP numbers of AMF by MPN method[2], the period of raising plants can be reduced from 45 to 25 days. This is achieved using PVC tubes of 3.2 cm dia. that can hold only 21 g of substrate (vermiculite 80% + sterilized soil 20%), which is easy to handle and more economical when compared to 300 g of soil in the original method. Thus the present procedure will not only bring about saving of substrate but, more importantly, save the assay time by 20 days.

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Corals dominate monofilament lines in Sesoko Island, Japan

The damage to corals and other coral-associated organisms due to various fishing methods and gears is long documented[1]. As observed in the Florida Keys, USA, 84% of the sponges and cnidarians have faced partial or full mortality due to the adverse effects of lost fishing gear[2]. However, only recently the effects of monofilament fishing lines on corals have been identified as seen in Hawaii, where they have caused higher mortality and damage to colonies compared to areas where fishing is not prevalent[1]. Monofilament lines were present in 65% of the colonies observed leading to partial or full mortality to 80% of corals[3]. Similarly, in the subtropical reefs of eastern Australia, monofilament lines have caused damage and mortality to *Pocillopora damicornis*, a common species in the region[4]. With such damage and mortality due to monofilament lines reported from different parts of the world, it becomes important to report any adaptive mechanism that has lead the corals to accept the presence of such debris rather than facing damage or death.

Sesoko Island (26°38′36″N, 127°51′51″E) in Japan, which is located towards the western side of mainland Okinawa supports the presence of a fringing reef[5]. Towards the southern end of the island, the reef gets denser where species of tabular *Acropora* seem common and dominant. Though commercial fishing surrounding the island is limited, local fishermen and tourists are seen regularly angling along the island edge, especially towards the southern part of the island where designated spots are present for fishermen and tourists to practice angling with a rod. Thus, it is highly probable for monofilament lines to get entangled within the coral colonies around the island.