

Ficus religiosa: habit, habitat and religion

The article by Sitaramam *et al.*¹ on *Ficus religiosa* (*Fr*) was of absorbing interest. The explanation by the authors that socio-anthropological association of *Fr* with religion appears to emanate from its habitat of being perched on the vertical sheer of rock piles and ancient buildings with its 'stem-root junction expanding into thallus-like evocative structures' appears logical and deserves serious consideration. However, regarding other aspects I have my own observations to add as an avid *Ficus* watcher. In north-west India, it is not uncommon to find *Fr* not only the way the authors have described but also on the top of buildings. It, however, needs moisture supply to sustain and thrive. Intermittent rain, a leaking drain or water pipe gives it ample opportunity to strike roots and get established. What is most striking is its ability to tolerate long periods of intermittent drought. Further, even if severed very close to the ground level in howsoever crude fashion, it has the ability to regenerate. To get rid of the plant, one has to get rid of its roots or, atleast, the root-shoot transition zone. This kind of 'maintenance' is not done on abandoned or government buildings, but even the most faithful amongst us take care to have this plant eradicated from our home buildings in a covert manner. If allowed to grow with ample moisture supply, the plant can cause severe cracking damage to cemented-brick structures within three to four years. I was witness to a *Fr* tree that got so firmly established in one of our university net houses that it not only cracked and ripped apart the brick-cemented floor and working slabs but also pushed up the angle iron bars along with the wire mesh. The authors' observations that they have recorded vertical sheer perched *Fr*s only on very ancient structures might be due to the fact that slowly over a period of time the roots of these plants have reached the soil (figures 1 and 2)¹. The fact that these are not established as adult plants on the roofs may be due to nonavailability of peren-

nial moisture and nutrition. That *Fr* is a class apart from the biologically fouling plants, does not grow at all on flat roof tops, that its roots are non-penetrating and may even have some binding effect in old building masonry is an exaggeration.

1. Sitaramam, V., Jog, S. R. and Tetali, P., *Curr. Sci.*, 2009, **97**, 637–640.

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Response:

We appreciate the interest of Rajiv Angrish in our paper on *Ficus religiosa* (*Fr*). No claim was made that it is unique in biological fouling as we described the other closely related species as well. But, none among these is as easy to recognize by any layman as is *Fr*, due to its leaf shape. Angrish talks about destruction and does not ponder how. What breaks the structure is not penetration by roots which are always extremely tender at the tips. The weight of a plant is not constant and, during rain, a large tree could collect liquid water in hundreds of kilograms. The best description is that of a lever effect. Wood swelling is far less likely to contribute, while root growth creating cracks is absurd. For example, a British textbook¹ argues that growing roots damage buildings similar to a wedge of dry wood separating a crack in granite on wetting! The geologists have dismissed this as botanical fiction even as we have, in print. Nutritional arguments are at best *post facto* since proper measurements for growth in these crevices are hardly possible. I have seen, pine

trees, that are 200–300-years-old, near the Athabasca glacier in the Rockies, which are merely 2–3 feet high due to very low availability of day-degree exposure. We went on a tour of forests and forts of Western Ghats away from recent human interference to observe these plants. A chance observation of the low border walls of plant nurseries made of rock piles with *Fr* growing on the sides in Konkan clinched the insight about its association with rock piles and religion and the generality for the Western Ghats by actual observation.

Our article is not exactly a measurement-oriented routine scientific paper but a 'general' paper. We are keenly aware of the fallacies in current plant physiology, particularly the so-called stress physiology, held dear by plant physiologists^{2–4}. We have actual photographs of long roots winding around thick masonry rocks in forts, bringing to fore the images of botanical descriptions of 'strangling' figs.

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1. Milburn, J. A. (ed.), *Water Flow in Plants*, Longman, New York, 1979.
 2. Sitaramam, V. and Madhavarao, C. N., *J. Theor. Biol.*, 1997, **189**, 333–352.
 3. Sitaramam, V., *Physiol. Mol. Biol. Plants*, 2006, **12**, 1–17.
 4. Sitaramam, V. and Rao, N. M., *Physiol. Mol. Biol. Plants*, 2006, **12**, 229–240.
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