will help to find new fungi comparable to known strains using rapid phylogenetic analyses. Such fungi would be available for further work regarding systematic bioprospecting or and other applied or ecological studies.

1. Kumar, D. S. S. and Hyde, K. D., *Fungal Divers.*, 2004, **17**, 69–90.
2. Wang, Y., Guo, L. D. and Hyde, K. D., *Fungal Divers.*, 2005, **20**, 235–260.
3. Petrini, O., Stone, J. and Carroll, F. E., *Can. J. Bot.*, 1982, **60**, 789–796.
4. Shankar, N. B., Shashikala, J. and Krishnamurthy, Y. L., *Fungal Ecol.*, 2008, **1**, 89–93.
5. Cannon, P. F. and Simmons, C. M., *Mycologia*, 2002, **94**, 210–220.
6. Manoharachary, C., Sridhar, K., Singh, R., Adholeya, A., Suryanarayanan, T. S., Rawat, S. and Johri, B. N., *Curr. Sci.*, 2005, **89**, 58–71.
7. Suryanarayanan, T. S., Kumaresean, V., and Johnson, J. A., *Can. J. Microbiol.*, 1998, **44**, 1003–1006.
8. Arnold, A. E., Maynard, Z. and Gilbert, G. S., *Mycol. Res.*, 2001, **105**, 1502–1507.
9. Frohlich, J., Hyde, K. D. and Petrini, O., *Mycol. Res.*, 2000, **104**, 1202–1212.
10. Crozier, J., Thomas, S. E., Aime, M. C., Evansand, H. C. and Holmes, K. A., *Plant Pathol.*, 2006, **55**, 783–791.
11. Lacap, D. C., Hyde, K. D. and Liew, E. C. Y., *Fungal Divers.*, 2003, **12**, 53–66.
12. Arnold, A. E., *Fungal Biol. Rev.*, 2007, **21**, 51–66.
13. Promputtha, I., Jeewon, R., Lumyong, S., McKenzie, E. H. C. and Hyde, K. D., *Fungal Divers.*, 2005, **20**, 167–186.
14. Guo, L. D., Hyde, K. D. and Liew, E. C. Y., *Mol. Phylogenet. Evol.*, 2001, **20**, 1–13.
15. Tao, G., Liu, Z. Y., Hyde, K. D. and Yu, Z. N., *Fungal Divers.*, **33**, 101–122.
16. Nikolcheva, L. G. and Barlocher, F., *Environ. Microbiol.*, 2003, **7**, 270–280.
17. Hyde, K. D. and Soytong, K., *Fungal Divers.*, 2008, **33**, 163–173.
18. Seena, S., Wynberg, N. and Barlocher, F., *Fungal Divers.*, 2008, **30**, 1–14.

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Carpinus viminea: a pioneer tree species of old landslide regions of Indian Himalaya

Carpinus viminea (Himalayan hornbeam) is one of the lesser-known tree species of the moist temperate forests of the Himalayan region. The tree is deciduous, wind-pollinated, moderate in size with conspicuously ribbed alternate leaves and branches. It usually occurs in isolated patches mainly on the bouldery/old landslide and low canopy areas of oak forests, rarely mixed with evergreen and deciduous tree species between 1800 and 2400 m asl. Its ecological role is similar to that of *Alnus nepalensis* in the riverine and landslide areas between 1300 and 1800 m asl. *C. viminea* is one of the most economically important species of the region. The wood is moderately hard and used mainly for making small timber. Leaves are used as fodder, and seeds and buds are eaten by several birds. It is also used for making shuttles, sports articles, musical instruments, agriculture implements, particularly turner and carved articles for general carpentry work. The pulp obtained from its wood has good mechanical properties and is suitable for manufacturing paper. Its bark is used as a traditional veterinary herbal medicine for setting fractured bones of animals. It burns very well and makes excellent charcoal for burning and for manufacturing gun powder. Having all these properties, this is an ideal substitute for oak species to the locals. The Indian Himala-

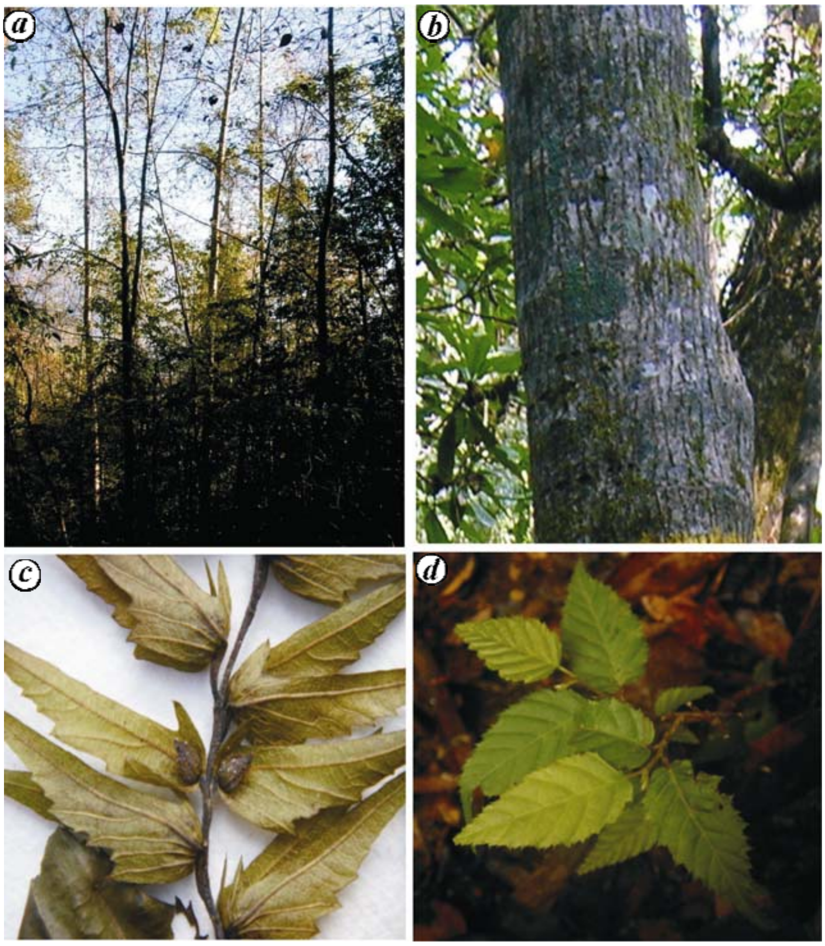

Figure 1. *Carpinus viminea*. ***a***, Forest stand; ***b***, bark; ***c***, bracts; ***d***, seedling.

yan regions are mainly dominated by one or the other species of oaks (*Quercus* spp.), which are rapidly degrading due to excessive exploitation by local people in terms of fuel wood and fodder. Continuous anthropogenic disturbance is reducing the cover of evergreen oaks, and the role of deciduous species may be important under such conditions. Presently, its common occurrence in the oak-dominated forests may not be a cause of concern. But does this assure that the future of pioneer community forming species in the bouldery and old landslides area is safe?

Continued disturbance is creating early succession conditions and modifying the environment, and consequently affecting the regeneration and growth of seedlings. This situation may favour the regeneration and growth of early succession deciduous species; regeneration of dominant evergreen species would be difficult in such conditions. Keeping in view the rapid decline of oak forests and shifting of collection practices towards lesser known fuelwood and fodder species, we feel that the future of *C. viminea* may not be that green. Our observations on the distribution and resource-use pattern of the local people in the Himalayan region indicate that if the present condition is continued in the near future, its patchy distribution from the moist temperate forests may no longer be present. The disappearance of this species from moist temperate forests may make life even harsher for the inhabitants. Thus more and more ecological studies on this species are of immediate concern.

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Slum-dwellers are relatively resistant to swine flu

The present H1N1 swine flu pandemic started as an outbreak in Mexico in March–April 2009. By July there were more than 10,000 laboratory confirmed cases with 119 deaths worldwide[1]. Major worry is that the present pandemic has many similarities with the devastating 1918–19 swine flu pandemic which killed about 50–100 million people worldwide (17 million in India). Both started in spring and affected young individual disproportionately. In Mexico 87% of the deaths, which were predominantly due to pneumonia, were individuals aged between 5 and 59 years. This is in contrast to the ‘seasonal’ flu where mortality is mostly restricted to senior citizens. In India the picture is no different, 75% of the deaths in Pune have been in people below 60 years of age.

Swine flu arrived in India on 13 May, through a passenger who travelled from USA to Hyderabad. Reeda Shaikh, a 14-year-old student, who died in Pune on 3 August 2009, was its first victim. Since then there is public panic created by a combination of media hype and nervous, unconvincing health authorities. Till 3 September a total of 111 people have succumbed to the flu in India. Maharashtra accounted for 58 deaths, of which 34 (58%) are from Pune[2].

General perception is that slum-dwellers would be highly susceptible to swine flu, but the facts indicate otherwise. Of the 34 deaths, only 2 victims (one adult and one infant) were from the slums (*Times of India*, Pune: 4 August to 4 September 2009). Slums account for 42% of Pune’s population. However, only 6% of flu deaths were from slums, an indication that slum dwellers exhibit some resistance to the flu virus. The first flu victim from a slum was a 35-year-old lady, also a case of mitral stenosis, who died on 26 August. She had shown flu signs about a week earlier when she would have been highly infectious. Incubation period of flu is generally 1–4 days. Considering the living conditions in slums, the virus should have spread like a fire resulting in an avalanche of positive cases. Nothing like that happened. Even her two children tested negative for the virus (*TOI*, Pune: 27 August 2009). In fact the pandemic is now waning[2]. During the last 10 days, the average number of positive cases in Pune has been 10 per day, which is about one fourth of the peak that was seen between 7 and 21 August 2009.

These observations indicate that slum dwellers are relatively resistant to swine flu. Mechanism of protection needs further investigation. Current epidemic is caused by a novel reassortant virus containing genes from swine (North American swine 30.6%, Eurasian swine 17.5%), avian (34.6%) and human (17.5%) flu viruses[3]. The relative proportions of the viral genes are 48.1%, 34.6% and 17.5% respectively. Swine are frequent inhabitants of slums. The slum population could get cross immunity from continuous subclinical exposures to swine viruses. Exposure to other infections, which are common in crowded slums, could also confer cross immunity. Cytokine storm, a response to viral antigens, is thought to be the major pathogenetic mechanism of swine flu pneumonia[4] and a healthy immune system appears to be a liability rather than an asset. In a recent survey we have found that 16% of slum dwellers in Pune are grossly underweight (data not shown). Malnutrition impairs cytokine production[5] and could also be a plausible mechanism of relative resistance to the flu observed in slum dwellers of Pune.

1. Thorner, A. R., Epidemiology, clinical manifestations and diagnosis of pandemic H1N1 influenza (swine influenza); www.utdol.com/home/content/topic.do?topicKey=pulm
2. Daily Press Releases on SWINE FLU: Ministry of Health, Government of India; http://india.gov.in/citizen/health/h1n1.php
3. Cohen, J., *Science*, 2009, **324**, 700–702.
4. Chan, M. C. W. *et al.*, *Resp. Res.*, 2005, **6,** 135–148.
5. Rodríguez, L. *et al.*, *Clin. Diagn. Lab. Immunol.*, 2005, **12**, 502–507.

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