

In this issue

Columbus and cooperation

Christopher Columbus (1451–1506) wanted to find new trade route to India through sea. While everybody tried the eastward routes, Columbus went west and indeed discovered something important – the ‘New World’. The solution to the problem of evolution of cooperation, given on **page 801** of this issue, has the Columbus logic.

Cooperation is a defining element of all social systems. Yet, how does costly cooperation evolve is a conundrum. Till date a number of conditional solutions have been proposed to resolve the problem of cooperation among unrelated individuals and include reciprocal altruism, reputation and punishment. These solutions try to sophisticate cooperative strategies in an attempt to explain the stability of cooperation. While these solutions work under some set of conditions, they fail in other. Dahanukar and Watve (**page 801**) propose a different route for the evolution of cooperation through sophistication of defection strategies. They suggest that in the presence of public knowledge of strategies employed by other players and social norms that punish defectors, novel defection strategies can evolve. If the punishment to a defector is harsh, some defectors will discriminate between non-punishing and punishing individuals and selectively cooperate with only the punishing individuals. Furthermore, in the presence of such discriminating defectors, some defectors will threaten other defectors through punishment to extract more cooperation. In the presence of such discriminating and punishing defectors, unconditional defectors get destabilized and pave the way for the evolution of punishing

cooperators who in turn maintains cooperation in the society. Thus, ironically, the sophistication in defection strategies stabilizes cooperation.

Anemophily and anemochory in *Shorea tumbergaia*

Shorea tumbergaia is an endemic and globally endangered, red-listed, semi-evergreen tree species. The flowering is ephemeral and also not an annual event. Massive blooming, drooping inflorescence with pendulous flowers, ample pollen production, gradual pollen release as a function of anther appendage, aerodynamic size of the pollen grains with reticulate exine and muri separated by lumina and strong protogyny – all contribute to anemophily. The plant is self-compatible but fruits resulting from selfed-flowers appear to be abortive. The fruits are large, winged



and disseminated by wind within a distance of 10 m. They are attacked by a bruchid beetle prior to dispersal. In healthy fruits, the seed has no dormancy and it germinates as soon as it falls from the tree. The study (**page 827**) reveals that non-annual massive flowering, short flowering period, partial flowering at tree level, seed predation, short-distance seed dispersal, absence of seed dormancy,

low rate of seedling establishment and inability of seedlings to compete with other plants collectively contributed to the occurrence of a small population of *S. tumbergaia* in a restricted area of Eastern Ghats forests. The interplay of all these factors might have led to the endemic and endangered status of this plants.

Medicinal plants of foreign origin

Madhuri and Pandey (**page 779**) review some medicinal plants used for the prevention and treatment of cancer in foreign countries. The article reports 62 medicinal plants of foreign origin. These plants belong to about 40 families, and their different parts (root, stem, bark, corm, bulb, leaf, fruit and seed) or the whole plants/herbs are used. The extracts or decoctions of these are generally used. The medicinal plants contain several phytochemicals that possess antioxidants, leading to anticancer activities. The antioxidant phytochemicals protect the cells from oxidative damage. In fact, the medicinal plants maintain the health and vitality of individuals, and also cure various diseases without causing toxicity. These drugs are known to have good immunomodulatory properties, since they act by stimulating both non-specific and specific immunity. Hence, consuming a diet rich in antioxidant plant foods (e.g. fruits and vegetables) will provide health-protective effects. The article provides the knowledge of anticancer medicinal plants of foreign origin, which are used by the people all over the world. Also, it is of significance to exploit novel anticancer drugs from these medicinal plants.