It may be worth mentioning that IIT Madras, which has been consistently ranked first in the top 100 overall had a cost per student per year of Rs 13.62 lakhs and cost per faculty per year of Rs 178.99 lakhs, the highest in the country. This is nearly 25 and 16 times the cost for a college from the top 100 in Tamil Nadu. This is the price to pay for excellence at this level.

The cost of maintaining a faculty or a student in Delhi is nearly twice that of the other three cohorts. CapEx is typically less than 8% of the total expenditure and indicates that these colleges perform very little research. Delhi has the lowest ratio at about 2% and Kerala has the highest at 8%. Delhi's significant showing in the NIRF top 100 is at the double the outlay cost and with a third of the relative CapEx to TotEx ratio. For IIT Madras, it is 18.3%.

At this stage, one more refinement can be brought in. These college rankings are now available from 2017. However, in 2017, there was hesitancy on the part of some of the leading colleges to participate. As a result, many colleges ranked in the top 100 in 2017 failed to qualify as the competition became tougher. It is a simple matter of curation to consolidate the results from 2018 to 2022 to see which colleges have been in the top 100 for all five years. There are 65, of which 27 (41.5%) are from Tamil Nadu, 22 (33.8%) from Delhi and 8 (12.3%) from Kerala. Andhra Pradesh (1), Karnataka (1), Gujarat (1), Maharashtra (1) and West Bengal (4) make up the rest.

Concluding remarks

With the data available in the public domain, we have looked at what are arguably the elite colleges of India by grouping them into four main cohorts. Unlike other ranking exercises, we have focused on what it costs in terms of faculty and spending to stay in the elite list of the top 100 colleges. The cost of maintaining a faculty or a student in one of the elite colleges in Delhi is nearly twice that of the other three cohorts.

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SCIENTIFIC CORRESPONDENCE

Dichogamy and reproductive success in *Tara spinosa* (Caesalpinioideae, Leguminosae)

Studies on the reproductive strategies of plants are important as they allow us to understand the life cycles of various plant species and provide clues regarding the processes of their macroevolution[1,2]. Thus, it is necessary to understand the causes for the functionality of different mating systems in plants, even in closely related species, for example, several species within Fabaceae[3], which have been poorly studied in terms of their reproductive biology[4,5] and taxonomic relationships[6].

In Fabaceae, *Caesalpinia sensu lato* comprises 150 species[6], of which only a few have their floral biology researched[7–12]. The genus *Caesalpinia* is characterized by flowers with yellow colour, bilateral symmetry, nectar guide and nectar production, characters strongly associated with allogamy[4,13]. Further, the flowers have mechanisms that reduce autogamy through dichogamy and self-incompatibility[13–16].

Tara spinosa (Feuillee ex Molina) Britton & Rose, formerly known as *Caesalpinia spinosa* (Feuillee ex Molina) Kuntze, is valued because the pods are a source of tannins while the seeds are a source of gums. It is also used in traditional medicine since the pre-Columbian era[7,10,11,17]. The Peruvian law treats this species as Vulnerable[18], because it is mostly exploited by wild populations. Several studies have been made on the reproductive and economic aspects of *T. spinosa*[19], but none on reproductive ecology. Therefore, the present study is aimed at evaluating its reproductive success, fecundation effectiveness, and the functionality of dichogamy.

The study was conducted with flowers collected at random from individuals growing in the cultivation at Fundo Canchacalla, at 2200–3215 m amsl, district of Ambo, Huánuco Department, Peru. To determine the reproductive success, fruit set rate (r_c) was estimated by dividing the average number of fruits produced per raceme by the average number of flowers[12]. Fecundation effectiveness was estimated by dividing the number of pollen grains by the total ovules per flower[20]. Dichogamy was estimated according to the Dafni method[21,22].

On an average, *T. spinosa* produces 80.3 ± 27.14 flowers and 19.9 ± 11.23 pods per raceme. The coefficient of variation in both cases was very high, which shows that the number of flowers and pods differs greatly from raceme to raceme. The r_c value was 23.89%; a low rate indicating that most flowers in *T. spinosa* do not reach fructification. The number of ovules per flower was 6.31 ± 0.73, with a minimum of 2 and a maximum of 8. In most cases, all ovules reached the seed stage after fecundation, as shown by a seed-ovule rate of 90.1%. Reaction to hydrogen peroxide was positive in 19 out of 20 flowers assessed, indicating that the receptivity of stigmata begins in the flower bud.

In *T. spinosa*, the low fruit set rate appears to be an indication of self-incompatibility as in other species of genus *Caesalpinia s. l.* The flower number per raceme was similar to that found in other species within the group[13,15]. *Caesalpinia crista* L., produced a very high number of flowers per panicle[12], while *Guilandina bonduc* (L.) Roxb. had a very low number of flowers per raceme[16]. In *T. spinosa*, although fruit set rate r_c was low, it was higher than that found in other species of *Caesalpinia s. l.*[3,5,12,13,15,16]. This result could be explained by the rate of autogamy in *T. spinosa*, which may corroborate the pollen to ovule rate estimated for this species[22,23], since it has been found that some members of the family Fabaceae can produce endogamous seeds without foreign pollen[3], despite the fact that self-incompatibility is the rule for the majority of the *Caesalpinia s. l.* species[12,13,16,22].

Regarding this apparent self-compatibility in *T. spinosa*, two hypotheses are proposed here: (a) the plant can produce endogamous seeds without foreign pollen or (b) the plant does not exhibit the wild traits anymore due to the domestication effect.

The fecundation process has been proved to be remarkably effective. This seems to be a constant in the entire *Caesalpinia s. l.* genus[5,13,15]. Protogyny is proven to occur in *T. spinosa*, also observed[5,12] or suggested[15] in other species of the genus.

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