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Seed abortion and seed storage

The seed marks the birth of a new individual in plant life cycle. A mother plant tends to achieve its maximum fitness by producing infinitely many large seeds. However, the finite quantities of resources exert control on mother plants to allocate increasingly greater resources towards reproduction. Thus, it is the seed number which is often compromised by tropical tree species in favour of seed size. Thus, few-to-many seeds abort during development presumably manifesting an increase in size of enduring seeds. An increase in seed size is an assurance to robust cotyledons and endosperm, the two important tissues that trigger germination and support early growth of seedlings until they independently photosynthesize food. Interestingly, it is not well understood if and how abortion of developing seeds benefits the enduring seeds. Also, an appealing question is if the supply of nutritive resources to a multi-seeded ovary is competitively monopolized by the developing seed/s if fellow seed/s abort/s within the same ovary, and if this monopolization is reflected in increased seed size. Paradoxically, plants produce a diverse range of reproductive structures (flowers, fruits and seeds) which have been the foremost reason for not conclusively arriving at definite answers to these questions. In contrary to leguminous pods, Uma Shankar (page 596) has shown that the abortion of one of the two developing seeds does not result in an increase in the weight of enduring seed within a capsular fruit of *Aquilaria malaccensis*. Therefore, the two developing seeds within a fruit are not in competition for resources. Notwithstanding, germination percentage increases with increase in seed mass, a trend commonly found in tropical tree species. The study further reveals sharp desiccation sensitivity of seeds, drawing the attention of foresters to utilize seeds soon after dispersal. *Aquilaria malaccensis* is a highly economic but threatened

tropical tree in South East Asia, known for the source of agar oil from the diseased portions of the heartwood.

Koinophilia revisited

This paper establishes an evolutionary link between two fundamental survival needs of sexual creatures, viz. mate selection and face recognition. As evolutionary success can be judged only in retrospect, koinophilic mate selection posits that sexual creatures show an obsessive affinity for the average while avoiding all deviant phenotypes.

When an average face is constructed, all the unusual features are cancelled out, leaving a face composed entirely of fit features. Therefore, if mates with average features produce more progeny, then features that differ markedly from the average will disappear at a faster rate than is achieved by natural selection alone. This has two effects. First, an interbreeding group of creatures will soon



start looking remarkably similar and different from other interbreeding groups, leading to speciation. Secondly, an average face cannot be judged to be strikingly attractive if there is not an equal pre-occupation with deviations from this average.

In this paper, Unnikrishnan (page 563) explains how the neurosensory evaluation of deviant features in potential mates generates an 'exception report', which characterizes individuality. The exception report model (ER model) is also quicker and more economical than other models popular in the literature. 'ER model' is nothing but the result of koinophilia-driven neurosensory

evaluation of both mate fitness and individuality in a single, rapid and an evolutionarily well-honed operation. Thus face recognition and mate selection become two sides of the same coin. Therefore, it is not surprising that the same regions in the brain are involved in both face recognition and the evaluation of attractiveness.

Preparation of calcium phosphate nanoparticle

Calcium phosphate has been used for many years as DNA delivery system in the cell lines and in bacterial cells. It has not been approved for use in vaccine adjuvant system as it has been known for site-specific reaction in the muscle cells. Because of its irritant effect, it is always discouraged to use it as an adjuvant. The nanoparticle size of calcium phosphate has been shown to be less irritant than its macroparticle counterpart. Tamuly and Saxena (page 610) have prepared calcium phosphate nanoparticle with bovine serum albumin with different stirring times and analysed its entrapment efficiency. It was found that stirring for 1 h yielded the nanoparticles. The protein entrapment efficiency of calcium phosphate nanoparticle was found to be 30%. The maximum amount of protein that could be loaded inside the nanoparticle was found to be 50 µg per mg of nanoparticles. The calcium phosphate nanoparticles were injected intramuscularly into rats for testing the site-specific inflammation. The muscle samples were collected on day 14 of injection. The smallest particle size of about 40 µm of calcium phosphate nanoparticle-BSA complex was obtained by stirring for 1 h. The calcium phosphate nanoparticles did not elicit any site-specific reaction in the rats as seen in histo-pathological examination. So, the calcium phosphate nanoparticles can be efficiently used as an adjuvant for non-live vaccines. However, further analysis of effect of calcium phosphate nanoparticles on the vital organs such as brain, liver, kidney is required to be conducted.