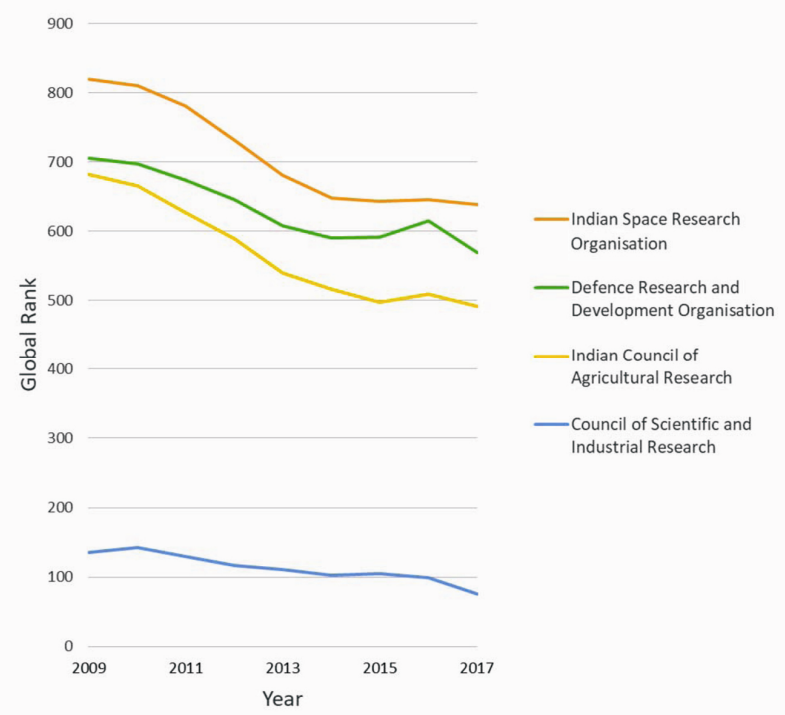

Figure 1. Progress of the top four agencies in the government sector in India.

Space Research Organisation. Table 1 shows the evolution of the rankings of the parent agencies in India, with CSIR far ahead of the rest. Figure 1 also displays the progress. It is seen that all agencies have been moving up the league tables globally.

Table 2 lists the evolution of the rankings of CSIR and its 29 daughter institutions that made the cut in 2017. Among the top 10 institutions in the government sector in India, CSIR contributes 7. The count has increased steadily, from 19 in 2009 to 29 in 2017. CSIR as an agency has been steadily rising in the ranks and so have many of the constituent laboratories under it. Some have been slow or stagnant, and a few have registered a decline. A noticeable fall has been noticed in case of CSIR-National Institute of Interdisciplinary Science and Technology.

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Drosophila ananassae – why it is considered as a unique species in the genus *Drosophila*

Drosophila is a genus belonging to the family Drosophilidae (class: Insecta and order: Diptera). It is characterized by rich species diversity at the global level as well as in India. Species belonging to the family Drosophlidae are commonly known as drosophilids. Although at the global level, the estimated number of species of the genus *Drosophila* is expected to be thousands, 1579 species have been described so far[1,2]. In India, 156 species of the genus *Drosophila* have been reported[3]. This number will certainly increase if taxonomy research is continued in the subcontinent. *Drosophila*, commonly known as fruit fly, is the best biological model. *D. melanogaster* which was initially used by T. H. Morgan in 1909 for genetical studies, continues to be the best biological model for different kinds of investigations throughout the world. However, other species have also been employed in various kinds of studies which include genetics, behaviour, evolution, molecular biology, ecology, etc. The species which have been reported from India fall into two types: new species and new records. The species which commonly occur in the country are: *D. melanogaster*, *D. ananassae*, *D. bipectinata*, *D. malerkotliana*, *D. parabipectinata*, *D. pseudoananassae*, *D. nasuta*, *D. albomicans*, *D. jumbulina*, *D. kikkawai*, *D. biarmipres*, *D. punjabiansis*, *D. buzzatii*, *D. seguyi*, *D. immigrans*, *D. suzukii*, *D. takahashii*, *D. hydei* and *D. repleta*. At the global level, a number of species have been used for population genetic and evolutionary studies. However, in India, *D. ananassae* has been most extensively studied for such studies[3,4]. It has been considered as a good model species for genetic, behavioural and evolutionary studies[5].

Doleschall[6] described *D. ananassae* for the first time from Ambon Island, Indonesia. It belongs to the *ananassae* species complex of the *ananassae* subgroup of the *melanogaster* species group[7]. It is a cosmopolitan and domestic species commonly found in India. As far as the population and evolutionary studies are concerned, *D. pseudoobscura*, *D. persimilis* and *D. robusta* from USA, *D. subobscura* from Europe and *D. ananassae* from Asia have been extensively studied[4]. In the whole genus, *D. ananassae*

has been considered as a unique species because it is characterized by a number of unusual genetic features[8]. The important cytogenetic and genetic peculiarities of this species are listed below:

(1) In the genus *Drosophila*, crossing-over occurs in females only and the recombination data obtained from females are used for constructing the genetic map. However, males do not show crossing-over. Interestingly, males of *D. ananassae* show spontaneous crossing-over which is meiotic in origin and variable in different strains[9].

(2) Spontaneous bilateral genetic mosaic for autosomal genes was reported in *D. ananassae*[10]. It was the first report of genetic mosaic for autosomal genes in *Drosophila.* Its probable origin was attributed to mitotic recombination in heterozygous individuals.

(3) High mutability is another unique feature of this species. It is also reflected by the presence of a large number of pericentic inversions and translocations. The optic morphology (*Om*) hypermutability system is unique in *D. ananassae*, which is associated with *tom* retrotransposon for the generation of *Om* mutations[11]. It is an interesting phenomenon which is unique as far as the mutagenic events are concerned.

(4) *D. ananassae* has been considered as an exception to the Dobzhansky's concept of genetic coadaptation because interracial hybridization does not lead to breakdown of heterosis. However, in other species of *Drosophila*, interracial hybridization leads to the loss of heterosis because coadapted polygenic complexes are broken down in interstrain crosses[12].

(5) Futch[13] reported the occurrence of parthenogenesis in *D. ananassae.*

(6) There are significant variations in resistance to different kinds of stress such as heat and cold shocks, starvation and desiccation[14,15]. A novel factor has been identified which showed that deposition of uric acid crystals in Malpighian tubules of flies has a regulatory role in tolerance to desiccation[16].

(7) Y-4 linkage of nucleolus organizer has been found in *D. ananassae.* In *Drosophila*, usually X–Y linked nucleolus organizer is found. Y-4 association of nucleolus organizer demonstrates that a translocation of nucleolus organizer region from X to 4 has occurred during the process of speciation in *D. ananassae*[17].

(8) A positive correlation among sternopleutral bristle number, mating propensity and fertility was found in *D. ananassae*[18].

(9) Although 78 paracentric inversions are known in this species, only 3 (AL, DE and ET) have become coextensive with the species, suggesting the monophyletic origin of these inversions. This is feature of chromosomal polymorphism in *D. ananassae.* Indian populations are genetically differentiated at the level of inversion polymorphism with north–south clines in inversion frequencies[3,5]. Population sub-structuring has been found at the level of inversion polymorphism in Indian populations[19]. Linkage disequilibrium between inversions may occur due to founder effect[20].

(10) Ethological (sexual or behavioural) isolation may originate due to founder effect and chromosome arrangement may affect mate recognition system in *D. ananassae*[21,22].

These interesting and unusual features of *D. ananassae* make it a unique species in the entire genus.

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