

## Pollination, Pollen Biology, Stigma Receptivity, Seed Dormancy Breaking Treatments on Hibiscus Rosa- Sinensis L.

Abirami S.\* & Kannan M.\*\*

Vivekanandha College Of Arts And Sciences For Women (Autonomous), Elayampalayam, Tiruchencode – 637 205.

Corresponding Author: Abirami S

---

**Abstract:** Normally the Pollination and natural product set is exceptionally uncommon in *Hibiscus rosa-sinensis L.* The investigation was centered around fake cross hand Pollination on four varieties of *Hibiscus rosa-sinensis L.* For the present examination Therkkumedu town, Salem area was picked. The investigation started from November 2017 to June 2018. Common Pollination of *Hibiscus rosa-sinensis L.* come about 0% natural product set, on the grounds that there were no pollinators or creepy crawly guests. In controlled Pollination medicines one sort of Pollination were analyzed. The fake cross hand - Pollination came about 100% on one assortment of *Hibiscus rosa-sinensis L.* since some quality groupings explanation behind Pollination actuating. Pollen science, shame receptivity, structure of ovule, seed lethargy breaking medicines were inspected. High rate Pollen feasibility, high level of shame receptivity, germination of Pollen tubes were analyzed in that specific natural product shaping assortment of *Hibiscus rosa-sinensis L.*

**Key word:** Pollination, Cross hand-pollination, *Hibiscus rosa-sinensis L.* , Pollen biology, Stigma receptivity, Seed dormancy breaking treatments.

---

Date of Submission: 29-07-2018

Date of acceptance:16-08-2018

---

### I. Introduction

Fundamental piece of the Polination is a Flower. *Hibiscus Rosa-Sinensis* an outstanding individual from the family Malvaceae, *Hibiscus rosa-sinensis* develops as an evergreen herbaceous plant. A local to tropical and sub-tropical areas, this plant is broadly developed as an elaborate plant. It bears substantial blooms on the rugged supports. These tremendous blossoms are typically dull red in shading and are not normally fragrant. Force, appealing foliage, solid root framework, life span, simple to keep up, great blossoming attributes, and so on are a portion of the qualities which are should have been remembered while cross reproducing the hibiscus plant. Today, different new assortments have been developed and created through cross rearing. These new assortments bear all the mixed attributes and are expanding in prominence also. Distinctive cultivars and half breeds have been created and created with blossoms extending in hues and different highlights. Unmistakable hues that have been advanced in the ongoing past are white, yellow, orange, red and distinctive shades of pink. Some portion of the Flower: Pedicellate, bisexual, substantial, flashy, pentamerous, actinomorphic, finish, hypogynous. Epicalyx:5-7 bracteoles constitute epicalyx beneath calyx. Calyx:Five sepals, gamosepalous, green, sub-par, valvate aestivation. Corolla:Five petals, polypetalous, somewhat joined underneath, adnate to the stamina tube, mediocre contorted aestivation. Androecium: Stamens uncertain, monadelphous, stamens from a stamina tube round the style, epipetalous, anthers monotheous, reniform, basifixed. Gynoecium: Five carpels(pentacarpellay), syncarpous ovary unrivaled, pentalocular, axile placentation, style long and goes through the stamina tube finishing in five unmistakable adjusted marks of disgrace.

Pollination is the consequence of Pollen being exchanged from the anther (male part) to the Stigma (female part) of another blossom. In spite of the fact that this can occur by abiotic implies (by means of transport in water or by wind) the lion's share happens through transport on the groups of blossom going by creatures. A wide assortment of life forms can go about as pollinators including winged animals, bats, different warm blooded creatures and creepy crawlies (Willmer2011). For this examination Malvaceae family were chosen.

The family Malvaceae is in the real gathering Angiosperms (blossoming plants).The family malvaceae also called Mallow or cotton family. This family comprises of around 243 genera and no less than 4,225 types of herbs, bushes, and trees. The individuals from this family are cosmopolitan in their appropriation. They are uncommonly found in tropical locales of the world. A few types of this family have been accounted for from our nation *H. rosasinensis* is a vast decorative bush with lovely red blooms. Various species are financially critical, including cotton (different *Gossypium* species), cacao (*Theobromacacao*), linden (*Tilia* species), durian (*Durio* species), *Hibiscus*, and okra (*Abelmoschusesculentus*) (Paul E. Berry).

An impressive work on Pollination science for the individuals from Malvaceae has been performed. In any case, little consideration was paid to the rearing investigations of the class *Hibiscus rosa-sinensis* L.. (Rubina abid, Jan alam and Qaiser M.2010). *Hibiscus* blooms in the wild are pollinated by creepy crawlies or winged animals, which exchange the Pollen from the stamen to the shame cushions. The kind of pollinator changes among species and by district. What stays steady is the way the blooms pulls in the pollinators. *Hibiscus* blooms pull in pollinators with their splendid hues and a bull's-eye design prompting a profound throat. The profound throat and noticeable stamen and Stigma mean pollinators need to knock the shame to test further in the blossom. Pollen adheres to the pollinators and is exchanged to the female parts of either a similar bloom or once in a while an alternate blossom. Pollinators are compensated for their Pollination exertion by being permitted to expend the surplus Pollen the blossoms create. Yet, these all normal kind of Pollinations isn't feasible for natural product development in *Hibiscus rosa-sinensis*L. Since we pick the bloom before finishing Pollination, The Pollen grains are can't achieve the Stigma, reason the anthers are available beneath the shame and the Pollen grains are before achieving the ovule the blossoms are falldown. (BhojwaniS.S,Bhatmagar S.P.2004). In addition no selective reports are accessible on *Hibiscus rosa-sinensis* L... The examination was directed to decide the Pollination component and part of hand cross-Pollination of *Hibiscus rosa-sinensis* L.. (Rubina abid, Jan alam and Qaiser M.2010).

**Aim And Objective:**

- ✓ To learn about Pollination of *Hibiscus rosa-sinensis* L..
- ✓ To learn about fruiting phenology.
- ✓ To learn about Seed lethargy torpidity and germination.
- ✓ To learn about Pollen science.
- ✓ To learn about Stigma receptivity, Structure of ovule in *Hibiscus rosa-sinensis* L..

**II. Materials & Methods**

**Study Area**

The examination region is Therkkumedu town, situated in sangakiritalluk, salem region was chosen.

**Pollination**

**Depiction Of *Hibiscus Rosa-Sinensis* L.**

Propensity: Ornamental lasting shrub.Root: Tap, branched.Stem: Erect ,woody ,fanned ,tube shaped ,glabrous and strong. Leaf: Simple, substitute, petiolate, stipulate, applaud, serrate, glabrous, pinnacle taper, multicostate reticulate venation.Inflorescence: Cymose , lone axillary.Flower:Pedicellate, bisexual, huge, ostentatious, pentamerous, actinomorphic, finish, hypogynous.Epicalyx:5-7 bracteoles constitute epicalyx beneath calyx.Calyx:Five sepals, gamosepalous, green, sub-par, valvate aestivation. Corolla:Five petals, polypetalous, somewhat joined beneath, adnate to the stamina tube, sub-par wound aestivation. Androecium: Stamens inconclusive, monadelphous, stamens from a stamina tube round the style, epipetalous, anthers monotheous, reniform, basifixed.Gynoecium: Five carpels(pentacarpellay), syncarpous ovary unrivaled, pentalocular, axile placentation, style long and goes through the stamina tube finishing in five particular adjusted stigmas.Fruit: Capsule,Dry dehiscent natural products, the organic product divider therapist and parts up uncovering the seed they ripen.Seed: Seeds contain hard seed coat with dark in shading.

**Cross Pollination**

Pollen is exchanged starting with one plant then onto the next, the procedure is called cross-pollination.Landing of Pollen on shame is no assurance for seed-set. Disappointment of treatment after self-Pollination in self-sterile plants may likewise be because of the failure of the Pollen to sprout without anyone else Stigma. Each one of those plants which Pollen from a blossom is unequipped for achieving treatment in a similar bloom are said to act naturally sterile or self-incongruent (BhojwaniS.S,Bhatmagar S.P.2004).Reasons for cross Pollination in a *Hibiscus rosa-sinensis* L. blossom , if both the sex organs develop in the meantime, the Pollination is averted by the plan of the sex organs at various statures. (G.N.Kulkarni.,2002).

**Hand Pollination**

Pollination were recorded by utilizing full grown blossoms were noted for the planning of natural product development and organic product dehiscence. Blossoms were watched precisely amid the life of single blossoms in both chose plant.Inflorescence is chosen indiscriminately from typical bloom character of *Hibiscus rosa-sinensis* L.(Red) plants. At a similar way another red shading mother plant was chosen with differentiate bloom character. These were taken after day by day. After dehiscence of anther, the Pollen grains are simply exchange from white bloom to Stigma of red flower(mother plant) by the hand. After exchange of Pollen grains, blossoms were observe day by day and watched deliberately in both plant.Pollen stack was seen by number of

Pollen grains kept on the stigma after Pollination. To decide the quantity of Pollen grains on the stigma open marks of Stigma were arbitrarily picked and expelled from the blooms that had quite recently experienced Pollination effectiveness was seen in the two plants. *Hibiscus rosa-sinensis* L. marks of Stigma get an around 20-25 Pollen grains in 24 hours. (Alexander 1987). Some Pollen grains are kept on the sticky surface of every Stigma and each perfect Pollen grain sends a tube through the style to the ovule to finish preparation. Inside three long periods of treatment, petals drop and the pistil starts to lengthen to frame a case as the seeds create inside.

### **Fruiting Phenology**

Seven to ten blooms were labeled and watched for phenology of organic product generation was watched twice in a month. During the perception, level of ready natural products in the covering were outwardly evaluated and noted for every person. Phenological perceptions were done for 7 months from January 2017 (Aruna R., Balasubramanian 2014).

### **Seed Dormancy And Seed Germination**

**SEED COLLECTION AND STORAGE:** Mature product of *Hibiscus rosa-sinensis* L. were gathered from the zone of the Therkkumedu, Thappakuttai (po) amid the period of January to February 2018. The seeds were put away in Normal temperature. Marielle C. Inacio 2012.

### **Physical Pre Treatment**

**Typical Water Treatment:** Seed were absorbed the ordinary water for 24 hrs. After treatment seeds were kept in disinfected petriplate fixed with a solitary layer of channel paper and soaked with refined water as and when required. **COOL WATER TREATMENT:** Seed were absorbed the chilly water for 24 hrs. After treatment seeds were kept in disinfected petriplate fixed with a solitary layer of channel paper and soaked with refined water as and when required. **CHILLY TEMPERATURE:** Seeds were placed in the little measuring glass at that point keep it in cooler (0°C) for 24 hrs. after the treatment seeds were taken out and set in the disinfected petriplates fixed with a solitary layer of channel paper and dampened with refined water as and when required.

**Scarification Treatment:** Mature seeds were taken in the pestle and mortar with measure up to volume of sand. Seeds were inexactly scarified for 5,10,15 minutes. After scarification taken out the seeds altogether washed the refined water. seeds were taken, kept in the sanitized petriplates fixed with a solitary layer of channel paper and dampened with refined water as and when required. **HOT WATER TREATMENT:** Seeds were treated with boiling water at 80°C took into consideration 5 minutes. At that point the seeds were taken out, cooled to room temperature for couple of minutes. Seeds were kept in sanitized petriplates fixed with a solitary layer of channel paper and dampened with refined water as and when required.

**Corrosive And Alcohol Treatments:** Seeds were treated with concentrated Sulphuric corrosive (H<sub>2</sub>SO<sub>4</sub>), Nitric corrosive (HNO<sub>3</sub>), Hydrochloric corrosive (HCL), Methanol (CH<sub>3</sub>OH) and Ethanol (C<sub>2</sub>H<sub>5</sub>OH) for 5,10,15 minutes respectively. Acids and liquor seeds treated and untreated (control) seeds were set on wet channel paper in petriplates. Watering was included when required through the examination.

**Salt Treatment:** Seeds were surface cleaned by quickly string the seeds in 2% mercuric chloride answer for 5,10,15 minutes and flushed completely washed in a few changes of refined water. Seeds were dealt with in Hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>), Sodium chloride (NaCl) for 5,10,15 minutes separately. Seeds were put on wet channel paper in petriplate with refined water the germination tallies were recorded for 10 days.

**Development Hormone Treatment:** Seeds were absorbed the distinctive grouping of Indole acidic corrosive arrangement arranged in 5,10,15 ppm for 24 hrs and 48 hrs of treatment seeds were put on soggy channel paper in petriplate for germination.

### **pollen biology**

**Bloom Collection:** Four assortment of *Hibiscus rosa-sinensis* L. plants were chosen for this examination. 1. *Hibiscus rosa-sinensis* L. (Red, organic product framing plant) were gathered from the Therkkumedu (through), salem (Dt). 2. *Hibiscus rosa-sinensis* L. (Red, Normal plant) likewise gathered from Therkkumedu (by means of), salem (Dt). 3. *Hibiscus rosa-sinensis* L. (Light pink) were gathered from Vivekanandha school of Arts and Sciences for ladies, grounds, Elayampalayam, Namakkal (Dt). 4. *Hibiscus rosa-sinensis* L. (White) were gathered from Elampillai, Salem (Dt). Blooms were gathered for this examination from above said.

### **Estimation Of Total Pollen Grains Per Plant Per A Day**

So as to evaluate add up to Pollen grains per bloom, one blossoms were taken from 4 distinctive chose Hibiscus rosa-sinensis L. species, utilizing the check strategy proposed by Cruden (1977). Anthers, taken from shut blooms moving toward anthesis, were pounded in 100 ml of refined water. Add up to Pollen was tallied from this focus by storing 10 ml on a slide. The check was rehashed three times for each focus. Refined water was recolored with fuch sine to encourage the checking of Pollen grains on the slide, for which a 4X focal point and a 10 X visual were utilized. The aggregate number of Pollen grains per anther was increased by the quantity of anthers per blossom to give the quantity of Pollen grains per bloom (Teresa Go' Mez-casero et al., 2004)

**Pollen Sample Collection:** Flowers were gathered and isolated anthers. Pollen grains were gathered from develop anthers.(Kemal Arora, 2014).

**Slide Preparation:** The anthers were pounded by utilizing a sharp cutting edge on the slide. Subsequent to smashing the anthers were isolated by utilizing needle under the perception of magnifying lens. At that point include a drop of Acetocarmane the anthers. In the wake of washing these anthers were set on the focal point of the slide and a drop of glycerine is set on it. At that point cover glass is set on it. Care is taken to maintain a strategic distance from air rise in the cover glass. At that point the edge of cover glass is fixed by utilizing nail clean to stay away from the section of glycerine. At that point the slide is marked and safeguarded. **PHOTO:** Photograph is taken by utilizing Olympus computerized camera under the perception of the Olympus H320i trinocular magnifying instrument.

**Viability:** Pollen grains were scored. Recolored as suitable and flawless as unviable. Atleast 200 Pollen grains were investigated per species. (Kuligowsk .K 2013).**SIZE MEASUREMENT:** The span of the Pollen grains are estimated by utilizing visual micrometer under the light magnifying instrument.

**Stigma Receptivity:** Stigmas (after and before Pollination), Alcohol, Acetic corrosive, Aniline blue-lactophenol, Olympus magnifying lens and camera. Shame receptivity was recorded by settling marks of Stigma of various ages in carnoy's fixative (3 liquor : 1 acidic corrosive) for 3-4 hours. The marks of Stigma were then recolored with aniline blue-lactophenol and examined under Olympus magnifying instrument. The marks of Stigma conveying the developing Pollen grains were considered as responsive. So as to discover length of shame receptivity, the marks of Stigma of shifting ages were pollinated physically by tidying on them the Pollen grains acquired in newly dehisced anthers with the assistance of a disinfected needle. The pollinated marks of shame were settled in 1:3 acidic liquor and in this way recolored in aniline blue-lacto phenol and concentrated intermittently under a magnifying instrument. (Shahzada Arshid and Aijaz A. Wani 2012).

### **Structure Of Ovule**

The Hibiscus rosa-sinensis L. (chosen four assortment) ovule were gathered creating ovules at the phase after Pollination for nitty gritty study. For anatomical examinations of the ovule, semi-thin longitudinal areas were cut, recolored with 1% Acetocarmane or Toluidinal blue and saw under an Olympus computerized magnifying lens. Microphotographs were taken utilizing a Magnus minute computerized camera. (Chudzik Barbara 2010).

## **III. Result And Discussion**

### **Pollination**

Pollination of the chose plants Hibiscus rosa-sinensis L.(Red shading) was examined from May 2016-February 2017.Pollination is the procedure by which Pollen is exchanged to the female regenerative organs of a plant, in this way empowering treatment to happen. Like every single living life form, seed plants have a solitary significant objective: to pass their hereditary data on to the people to come. The conceptive unit is the seed, and Pollination is a basic advance in the generation of seeds in Hibiscus rosa-sinensis L.( Plant Reproduction:837-850).

Pollination to be fruitful, a Pollen grain created by the anther, the male piece of a red blossom of Hibiscus rosa-sinensis L. , must be exchanged to a shame of another blossom in a same plant. In Hibiscus rosa-sinensis L, after the Pollen grain has arrived on the Stigma, it makes a Pollen tube which becomes down the style until the point that it achieves the ovary. Sperm cells from the Pollen grain at that point move along the Pollen tube, enter the egg cell through the micropyle and treat it, bringing about the generation of a seed.

A fruitful Pollen grain (gametophyte) containing the male gametes is transported to the shame, where it develops and its Pollen tube becomes down the style to the ovary. Its two gametes make a trip down the tube to where the gametophyte(s) containing the female gametes are held inside the carpel. One core wires with the polar bodies to create the endosperm tissues, and the other with the ovule to deliver the incipient organism Hence the expression: "twofold Pollination".(Fritsch, Felix Eugene; Salisbury, Edward James 1920).

Characteristic Pollination of *Hibiscus rosa-sinensis* L. come about 0% natural product set, in light of the fact that there is no any pollinators or creepy crawly guests. In controlled Pollination medicines one kind of Pollination were examined. That is cross Pollination Xenogamy, came about better outcomes and additionally it affirms the Pollination occur by hand Pollination.

**Fruiting Phonology:** *Hibiscus rosa-sinensis* L. bore organic products amid long stretches of January to July. The fruiting pinnacle was found in June with most extreme labeled people in fruiting. Different organic products are tumble down before developed. Table: 1

**Seed Dormancy And Seed Germination:** Seeds of *Hibiscus-rosa sinensis* L. were gathered from plants developing in Therkumedu (by means of). After accumulation, develop seeds-species were put away at research facility conditions. Torpidity breaking tests were led in standard research facility conditions. The torpidity breaking test seeds were set on channel paper moistend with refined water in 9 cm petridishes wrapped with petriplates cover. Developed seeds were checked amid the tests and water was added as expected to keep the substrate damp. Projection on the radical was the paradigm for germination. Five seeds from every treatment were tried for every treatment were tried for torpidity breaking.

There is no any seed germination in physical medicines. So torpidity breaking rate is zero in all physical treatments. Control 5 min and came about negative in breaking lethargy. Table:2

Seeds were dealt with Sulphuric corrosive, essentially lethargy of seeds were broken. Among seeds treated with in various planning in 5 to 15 minutes seeds torpidity were broken. In 5 min one seeds were developed at day five as radicle rises out and no further changes happens. There were no adjustments in germination of seed from 6 to 10 days were taken note. Table:3

In 10 min impact of H<sub>2</sub>SO<sub>4</sub> is breaking lethargy is zero. Since seeds are undesirable likewise youthful seeds. In 15 min, four seeds were begun to sprouted on day five as radical rises out on sixth day five seeds were developed. In seeds were treated with concentrated Nitric corrosive torpidity of seeds were broken. In nitric corrosive 5 to 15 min time term torpidity of seeds were broken. In 15 min 1 seeds were sprouted on day five and further no adjustments in germination till tenth day analyze. There is no any germination in 5 and 10 min time term.

Seeds were treated with concentrated Hydrochloric corrosive. In 5 min, 10 min, 15 min time lengths. In 5 min 1 seeds were begun to germination on day eighth . There is no any germination in 10 and 15 minutes term. From every single above corrosive most noteworthy germination rate is noted in focused Sulphuric corrosive 15 min on day fifth onwards. In Nitric corrosive developed seeds happens on fifth day length and Hcl sprouted seeds happens on eighth day term.

Seeds were (dealt with) absorbed supreme ethanol and 100 % ethanol and methanol in various timings 5 min, 10 min, 15 min seed torpidity breaking were altogether bombed in the two alcohols in various timings. Table: 4 . *Hibiscus-rosa sinensis* L.seeds were dealt with various salts at different convergence of various timings. Salts like Hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>), Sodium hypochloride (NaHCL) and sodium chloride (Nacl) were chosen in view of writing were the salt treatment effectively lethargy of seeds were broken by just in hydrogen peroxide (15 min span) on multi day. Seed torpidity breaking were altogether bombed in both sodium hypochloride (NaHCL<sub>2</sub>) and sodium chloride (Nacl) additionally Hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) 5 AND 10 minutes time term. In charge there is no any seeds were developed Table:5

Development hormone like IAA were taken for breaking lethargy. Different fixation like 5 and 10 ppm were set up to treat the seeds apathetic timings (24 hrs and 48 hrs). Development hormone treatment additionally demonstrate negative outcome. No germination was seen in different focus and diverse timings in all trial days. Seed lethargy breaking is essentially bombed in hormone medicines. Table:6

### **Pollen Biology**

The most elevated normal number of Pollen grains per plant/day was gotten in *Hibiscus rosa-sinensis* L. Red assortment organic product shaping plant (262500). Result was altogether different for chose four species. Table:7 (Maria Teresa Go' Mez-casero et al., 2004). Light microscopy of the Pollen grains of four assortment of *Hibiscus rosa-sinensis* L. uncovered same auxiliary attributes, with various size. The surface of Pollen grains was Round colporate having various round tip spines and opercula. (Komal Arora 2014). *Hibiscus rosa-sinensis* L. Pollen demonstrating numerous tubes. (Kuligowska K. et al., 2013). Pollen morphology of four assortments of *Hibiscus rosa-sinensis* L. is portrayed: (Pradip Hirapure et al., 2014) and furthermore size of Pollen grain was estimated. Table:8

### **Pollen Viability**

*Hibiscus rosa-sinensis* L. Red-natural product framing plant(98%) demonstrated the most astounding level of reasonability after the 24 hrs. Table:9 (Maria Teresa Go' Mez-casero et al., 2004). Pollen quality is one of the critical variables impacting Pollination achievement. There are numerous techniques accessible to survey

Pollen suitability (Rodriguez-Riano and Dafni, 2000). In our investigation, we inspected Pollen quality utilizing acetocarmine recoloring and led in vitro germination examination. Results got from recoloring practicality test uncovered high level of rich Pollen, while germination rate in vitro was low. Moreover, the level of developed Pollen grains did not connect with in situ perceptions of Pollen tubes rising up out of grains. Despite the fact that acetocarmine recoloring has been reprimanded that it additionally can recolor dead Pollen (Rodriguez-Riano and Dafni, 2000), fruitful Pollination depends to some extent on Pollen generation (Allison 1990). The ability to deliver Pollen is under hereditary and physiological control. Atmosphere, notwithstanding impacting time of dehiscence and bloom thickness, likewise impacts Pollen amounts created (Stanley and Linskens 1974, Fornaciari et al. 1997, Gala'n et al. 2001).

**PLATE-1**



*Hibiscus rosa-sinensis* L. (Red)



*Hibiscus rosa-sinensis* L.(Red)



*Hibiscus rosa-sinensis* L.(White)



*Hibiscus rosa-sinensis* L. (Pink)



Transfer of pollen grains



Stigmatic pollen



Pollinated flowers are covered



Corolla closure



Corolla fall down



Month of January 2017



Month of April 2017



Month of May 2017

**PLATE-2**



Month of June 2017



Month of July 2017



Fruit dehiscence



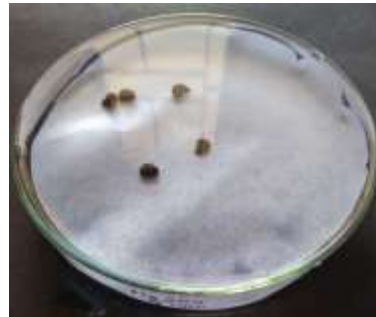
Seeds of *Hibiscus rosa-sinensis* L.



Cup seed germination



Field seed germination



Sulphuric acid (5 min)



Sulphuric acid (15 min)



HCL (5 min)



Cocentrated Nitric acid(15 min)



Hydrogen peroxide (15 min)

**PLATE-3**



Normal red variety pollen



Fruit forming red variety pollen



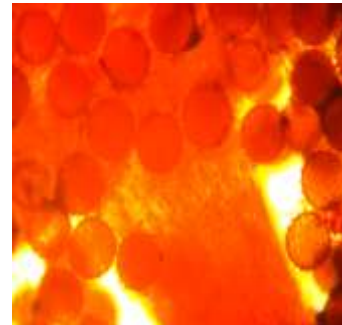
White variety pollen



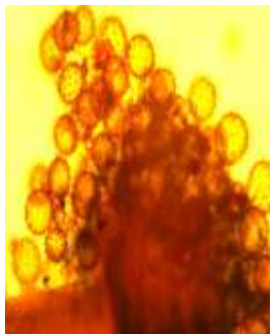
Pink variety pollen



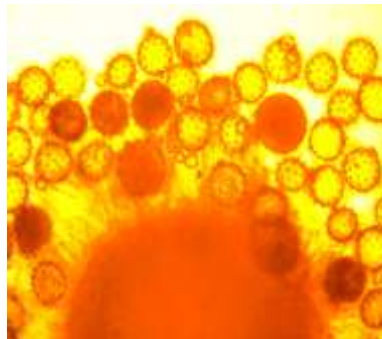
Normal red variety stig.pollen



Fruit forming red variety stig.pollen



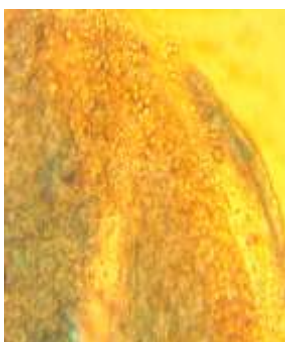
White variety stig.pollen



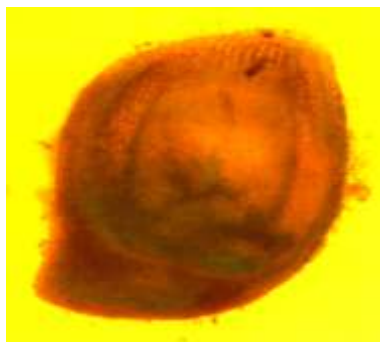
Pink variety stig.pollen



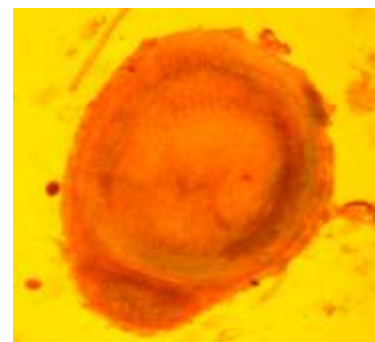
Normal red variety ovule



Fruit forming red variety ovule



White variety ovule



Pink variety ovule

### **Stigma Receptivity**

In *Hibiscus rosa-sinensis* L. the Stigma ends up responsive and the receptivity goes on for 1 - 2 days. The quantity of stored Pollen grains was most elevated on *Hibiscus rosa-sinensis* L. (Red-natural product framing plant). After this the receptivity of the Stigma diminishes progressively inside a few days as the shame ends up darker and dry and the quantity of Pollen grains stored on the shame (Shahzada arshid and Aijaz A. wani 2012). Table:10



### Structure Of Ovule

The ovules of *Hibiscus rosa-sinensis* L. (Red-organic product shaping plant) examined were detached from the ovaries of exaggerated blooms. The anatomical structure of such ovules is obviously noticeable in longitudinal segments. The ovules of *Hibiscus rosa-sinensis* L. (Red-natural product shaping plant) are ana-amphitropous with the micropyle coordinated towards the highest point of the loculus and the funiculus situated close to the ovary divider. Pollen grains are just present in *Hibiscus rosa-sinensis* L. (Red-natural product shaping plant). Pollen grains are missing in different assortments *Hibiscus rosa-sinensis* L. (White), *Hibiscus rosa-sinensis* L. (Pink), *Hibiscus rosa-sinensis* L. (Red-ordinary plant).

### IV. Summary And Conclusion

The examination was centered around Pollination of *Hibiscus rosa-sinensis* L. Pollination was followed in four distinct assortments of *Hibiscus rosa-sinensis* L. (pink, white, two distinctive red varieties). The examine region is arranged at Therkkumedu, Salem area. The investigation started from November 2017 to June 2018. Common Pollination of *Hibiscus rosa-sinensis* L. come about 0% natural product set, in light of the fact that there is no any pollinators or bug guests. In controlled Pollination medicines one sort of Pollination were inspected. That is cross Pollination, came about better outcomes and additionally it affirms the Pollination happen by hand Pollination. This technique is give 100% outcome *Hibiscus rosa-sinensis* L. In same types of *Hibiscus rosa-sinensis* L. cross Pollination is fizzled. At the point when cross Pollination falls flat, the shame twist down ward. Structure of Pollen (male regenerative part) and Structure of ovule (female conceptive part), stigmatic Pollen and Pollen suitability was watched. Pollination to be effective, a Pollen grain delivered by the anther the male piece of a *Hibiscus rosa-sinensis* L. , must be exchanged to a Stigma of *Hibiscus rosa-sinensis* L. the female piece of the blossom. In *Hibiscus rosa-sinensis* L. after the Pollen grain has arrived on the shame, it makes a Pollen tubem which becomes down the styl until the point when it achieves the ovary. Sperm cells from the Pollen grain at that point move along the Pollen tube, enter the egg cell through the micropyle and prepare it, bringing about the generation of a seed. In counterfeit cross-Pollination tests successfully 100% of organic product set and seed set was watched. Natural product arrangement, organic product dehiscence and seed dispersal was watched. And furthermore watched seed lethargy. Gave strategies for breaking lethargy and watch seed germination in both container and field. Normally the Pollination and organic product set is exceptionally uncommon in *Hibiscus rosa-sinensis* L. Fake cross-Pollination was followed in four distinctive assortment of *Hibiscus rosa-sinensis* L. mother plants. The outcome positive in one kind of red mother plant, result negative in another sort of mother plant. Since the bloom character is altogether unique. So the positive Pollination depends on the bloom character and Environmental effects like Loss of pollinators, additionally has been seen as of late however for the most part quality sequencing likewise associated with Pollination, natural product arrangement and seed set. It is another record of cross hand-Pollination in *Hibiscus rosa-sinensis* L.. 100 % positive Pollination brings about especially that kind of red assortment.

### Acknowledgements

My exceptional on account of my Vivekanandha establishment and My ardent because of almightily who has given me the quality bravery and gift to finish the work effectively.

### Literature Cited

- [1]. Alexander, M.P. 1987. A Method for staining pollen tubes in pistil. *Stain Tech.* 62 (2): 107-112.
- [2]. Allison, T. D. 1990. Pollen production and plant density affect pollination and seed production in *Taxus canadensis*. – *Ecology* 71: 516 – 522.
- [3]. Alpna Johri and Raghuvanshi R.K. (2014) studied the Floral biology, Pollination and Breeding system in *Alcea rosea* (L.) syn. *Althaea chinensis* Wall. (Malvaceae). *The International Journal of Plant Reproductive Biology* Vol 6(2) pp. 139-144.
- [4]. Ariano, R. et al., (2006). In Vitro and In Vivo Biological Activities of Old and Fresh *Cupressus arizonica* Pollen. *J Investig Allergol Clin Immunol* Vol. 16(3): 177-182.
- [5]. Aruna R., Balasubramanian 2014. Fruiting phenology and avian frugivory of *Streblus asperlour*. In a mixed dry deciduous forest, Western Ghats, India. *International letters of natural sciences*. Vol 22:16-21.
- [6]. Bhojwani S.S. and Bhatmagar S.P et al., 2004. Embryology of Angiosperms. VIKAS publishing house P.V.T.Ltd; 108-125.
- [7]. Chudzik Barbara (2010), the structure of the ovule of *Sida hermaphrodita* L. Rusby after pollination. *Acta agrobotanica*. Vol. 63 (2):3-11.
- [8]. Cruden, R. W. 1977. Pollen-Ovule ratios. A conservative indicator of breeding systems in flowering plants. – *Evolution* 31: 32 – 46.
- [9]. Kemal Arora 2014. Pollen identification of *Hibiscus rosa-sinensis* L. and *Sida acuta* through FTIR Spectroscopy. *International journal of Fundamental and applied life sciences* ISSN. Vol 4(4): 141-144.
- [10]. Kulkarni G.N 2002. Principles of seed technology. 1-390.
- [11]. Maria Teresa Go´mez-casero et al., 2004 . Pollen biology in four Mediterranean *Quercus* species. *Grana* 43: 22–30.
- [12]. Mariella C. Inario 2012. Phenolic compounds influence seed Dormancy of *Palicourea rigida* H.B.K (Rubiaceae) a medicinal plant of the Brazilian savannah. *American journal of plant sciences*, vol 4: 129-133.
- [13]. Rodriguez-Riano, T. and Dafni, A. 2000. A new procedure to assess pollen viability. *Sex Plant Reprod.* 12:241-244.
- [14].

- [15]. Rubina abid, Jan alam and Qaiser M. (2010). Pollination mechanism and role of insects in *Abutilon indicum* L. Sweet. Flowers of *Abutilon indicum* (L.) Sweet. *Pak. J. Bot.*, 42(3): 1395-1399.
- [16]. Pradip Hirapure et al., 2014. Morphological Study of Pollen as an Aid in Criminal Investigation. *Sch. Acad. J. Biosci.*, 2014; 2(3): 187-192.
- [17]. Shahzada arshid & Aijaz A. wani 2012. Pollen biology and stigma receptivity in *Myrophyllum spicatum* L. an invasive species Himalayan aquatic ecosystems. *International journal of advanced life sciences (IJALS)*; Vol.3: 13-20.
- [18]. Stanley, R. G. & Linskens, H. F. 1974. *Pollen biology, biochemistry, management*. –Springer, Berlin/Heidelberg/New York.
- [19]. Willmer P. 2011 *Pollination and floral ecology* . Princeton university press.

\* Abirami S “Pollination, Pollen Biology, Stigma Receptivity, Seed Dormancy Breaking Treatments on *Hibiscus Rosa- Sinensis* L.” *International Journal of Engineering Science Invention (IJESI)*, vol. 07, no. 8, 2018,01-10