DEVELOPMENT AND GROWTH STAGES OF *KERRIA LACCA* ON *FLEMINGIA SEMIALATA* ROXBERG AND *FLEMINGIA MICROPHYLLA* WILLD

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ABSTRACT

Lac insects belong to the super-family *coccoidea* (Hemiptera: Sternorrhyncha), commonly known as scale insects or *coccoids*, which comprises of about 7,500 species under variable number of families (20 and above). Globally, ninety species of Tachardiidae have been reported under nine genera. Twenty-one species of *Kerria* have been reported so far. Out of the 14 species of *Kerria* reported in India, only a few are exploited for commercial lac production. Tree-hosts, depending upon their habit, 15-20 years to reach the stage of lac inoculation and hence, do not find favour with the lac growers for raising systematic plantations to grow lac. To cultivate lac on plantation basis, some short stature, fast growing perennial shrubs have been identified for systematic plantation raising and/or integrating with agricultural crops. *Flemingia semialata* Roxberg and *Flemingia macrophylla* Willd have shown great promise for lac production due to its fast growth, tender shoots and suitably for intensive lac cultivation. Being an immobile pest, generating information on development and growth stages under the local conditions is essential. Information on the three instars, female cell weight and cell diameter were identified. The study is helpful in designing future integrated management of this pest.

Keywords: *Kerria lacca, Flemingia semialata, Flemingia microphylla,* Growth stages

INTRODUCTION:

The lac insects [Coccoidea: Tachardiidae (=Kerriidae) are commercially harnessed to derive three useful products, viz., resin, wax and dye, which find remarkably wide range of applications in food, pharmaceuticals, cosmetics, perfumes, varnishes, paints and polishes, adhesive, jewellery and textile dyeing, since ancient times (Dave; 1950; Sarker, 2002 and Ramani *et al., 2007*). Lac is the only resin of animal orgin. The importance of this commodity lies in its safety for human use and as a renewable and eco-friendly resource. Lac production is confined to a few South, South East and East Asian countries in the tropical forest region (Ramani *et al*., 2007). India is the leading lac producing country, with an annual production of about twenty thousands tons (Pal *et al*., 2010). In modern world, lac is being preferred since it is natural, non-toxic, and eco-friendly. Lac has very high potential to be used for many applications due to its unique blend of characteristics (Sharma, 2009) India possess a huge potential for lac production and its possibilities to achieve a multi-fold increase in lac production (Ramani, 2002).

Lac cultivation has been traditionally carried out on naturally occurring tree hosts. Palas (*Butea monosperma* Lamk), Ber (*Ziziphus mauritiana* Lam) and Kusum (*Schleichera oleosa* Lour) are considered major lac-hosts of all India importance, as about 90% of the lac produced in our country comes from these three hosts. Besides these three, there are some other important tree species belonging to Acacia, Albizia, Ficus etc. Which are utilized for commercial production of lac. However, these hosts lie scattered in the forests leading to difficulties in efficient utilization for production of lac. To make matter worse, population of these host-trees is decreasing also, that too rapidly due to deforestation and unawareness of their economic potential.

Tree-hosts, depending upon their habit, take 15-20 years to reach the stage of lac inoculation and hence, do not find favour with the lac growers for raising systametic plantations to grow lac. Moreover, lac culture operations have to be carried out by climbing on to the tree which is cumbersome in the absence mechanized methods. Lack of skilled man-power in the changing socio-economic scenario is further adding to the woes of lac development. Therefore, to address the above issues and to cultivate lac on plantation basis, some short stature, fast growing perennial shrubs have been identified for systematic plantation raising and/ or integrating with agricultural crops. *Flemingia semialata* Roxberg and *Flemingia macrophylla* willd shown great promise for lac production due to its fast growth, tender shoots and suitability for intensive lac cultivation. Identification of *Semialata* as a potential Kusmi lac-host especially for growing winter season (Aghani) lac crop, has come as boon to farmers who do not have lac-hosts but are interested in lac cultivation.

MATERIALS AND METHODS

Propagation of *F. semialata* and *F.macrophylla*

Propagation of *F. semialata* was done through seeds by raising seedlings in polythene bags filled with homogenous mixture of soil FYM and sand in the ratio of 2:1:1. 2-3 seeds were sown in the middle of the bag atleast 2-3 cm deep. The seedlings became ready for transplanting when they attain the height of 40 cm. The *F. semialata* plants were inoculated during july aug for winter season kusumi lac crop by tying kusumi brrod lac @ 10g/m inoculable shoot length in 60 mesh synthetic nylon net container. The lower 5-6 leaves were removed just before to inoculation for providing good aeration to the lac crop during rainy season. After 3-5 days of inoculation, brood lac were rotated among the bushes.

RESULTS:

DEVELOPMENT AND GROWTH STAGE OF *K. lacca* ON BUSHY HOSTS

The developmental period for both males and females were recorded in both the bushy host plants and studied excluding the treatments., and significant differences were observed. The males developed in 2 days in *F.semialata* Roxberg,and 3 days in *F.macrophylla* willd (Resh and Carde., 2009) and females took longer duration of 150 days and 141 days in *F.semialata* Roxberg and *F.macrophylla* willd respectively.

Other growth attributes such as female cell diameter and female cell weight showed significant differences when both the bushy plant species were compared.

Development and growth stages of *K. lacca* on bushy hosts, *F.semialata* and *F.macrophylla*

Flemingia semialata							
Attribute	**Instars (Days)**						
	I	II	III	Male	Female	Female cell Diameter	Female cell weight(mg)
Size (Length in mm)	0.6	1.4	1.5	1.5	5	3.42	22.85
Development (Days)	20	15	2	2	150	-	-

Flemingia macrophylla							
Attribute	**Instars (Days)**						
	I	II	III	Male	Female	Female cell Diameter	Female cell weight(mg)
Size (Length in mm)	0.5	1.1	2.1	1.3	4.2	2.90	19.51
Development (Days)	22.	13	11	3	141	-	-

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