



RESEARCH NOTE

A report on incidence of leaf gall psyllid, *Pauropsylla tuberculata* on Scholar tree, *Alstonia scholaris* in Rajasthan, India

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ABSTRACT: This research paper reports the gall infestation on an ornamentals tree *Alstonia scholaris*, commonly called Scholar tree, caused by *Pauropsylla tuberculata* (Order: Hemiptera). The infested leaves bearing galls were collected from *Alstonia* trees and observed under dissecting microscope. Under this study we assessed the morphology of gall infested leaves, insect and damage symptoms. These pouch gall enclosed different development stages of insect *P. tuberculata*. The nymphal stage of the gall insect is completed within the galls and later imago exits from the galls through a small opening in the gall. Galls initially are greenish but later on get brownish on maturity.

Keywords: *Alstonia scholaris*, leaf gall, psyllid, Rajasthan, *Pauropsylla tuberculata*

Alstonia scholaris (Scholar Tree) is an ornamental tree, popularly known as satpatia and belongs to family Apocynaceae. It is considered as an important medicinal tree in the traditional systems of medicine. The tree reaches a height of 50 to 80 feet, with a furrowed trunk and oblong leaves. The paste of bark is used topically in chronic skin ulcers, given to lactating mothers for increasing lactation, enhance digestive power and has antipyretic properties (<https://www.dabur.com/amp/in/en-us/about/science-of-ayurveda/herbal-medicinal-plants/alstonia-scholaris-medicinal-uses> retrieved on 8-11-21). As per Baliga (2010), *A. scholaris* possesses radiomodulatory, chemomodulatory, and chemopreventive effects and antioxidant, anti-inflammatory, antimutagenic, and immunomodulatory activities which prevents cancer. *A. scholaris* is an important source of pulai timber and used for pattern making, plywood and carving etc.

Some biotic factors which affect these tree include infestation by *Parotis marginata* (leaf skeletonizer), termites, pinhole and marine borers, lyctid borers (http://apps.worldagroforestry.org/treedb2/AFTPDFS/Alstonia_scholaris.PDF, retrieved on 8-11-21) but presently in Rajasthan infestation of leaf gall was noticed on *A. scholaris*, caused by *Pauropsylla tuberculata*. As per Raman (2003), hemipteran induced galls are caused by insect belonging to four superfamilies; Aphidoidea, Psylloidea, Coccoidea and Aleyrodoidea. Within the family Psyllidae, there are about 350 widely distributed gall inducing insect species infesting leaves of dicotyledonous plants (Hodkinson, 1984). Psyllid galls may be found isolated or aggregated on leaf surface and having simple or complex structures (Hodkinson 1984, Dreger-Jauffret & Shorthouse 1992, Raman 2003).

The present work aims to study infestation by a psyllid *Pauropsylla tuberculata*, causing leaf gall of *Alstonia scholaris*.

The infected plant leaves look craggy and disfigured. Pouch like globular galls were found on both upper and under side of the leaves. Gall formation initiates as the adult *P. tuberculata* oviposits on leaves. The initial noticeable change can be seen as slight discolorisation at the site of eggs deposition on the leaf surface. Progressively a small outgrowth in the form of gall appears on the leaf surface which later enlarges into a dome shaped structure to hold different development stages of insect. The immature galls are green in colour and bulbous in shape. The mature galls changes to brownish black in colour and become hard and woody and remain on the leaf long after the escape of the adult insect. When the leaves are heavily infested with galls, the lamina gets reduced to a single cluster of cells. With the severity of infestation more number of gall appear and leafs become crumbled and deformed. Morphological, anatomical and biochemical studies on the foliar galls of *Alstonia scholaris* induced by *Pauropsylla tuberculata* (Psyllidae) was also studied by Albert (2011).

P. tuberculata belongs to order Hemiptera and has egg, nymph and adult stage in life cycle. Adult female lays eggs close to the midrib or side veins on the upper surface of leaf. The nymphs are elliptical in shaped with clearly defined abdomen and thorax and hair like structures covering the body. At the time of emergence mature instars nymphs come out of the gall through an exit hole and moult into an adult. Maximum number of galls on the leaves is observed on the upper side near the midrib and side veins. The number of gall on leafs were

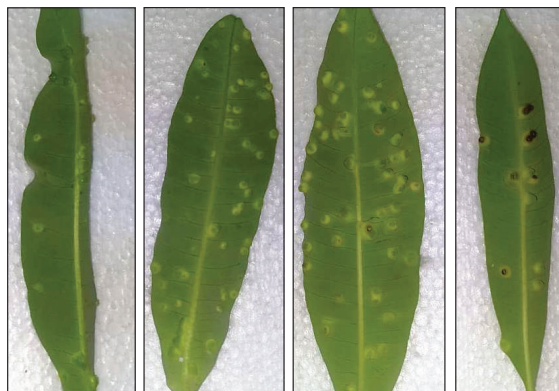
Fig. 1. *Alstonia scholaris*

Fig. 2. Stages of leaf gall formation

Fig. 3. Nymph of *P. tuberculata*

found to vary between 9- 47 per leaf. The infestation ranges from 35-45% per tree. Both young and mature leaves of *A. scholaris* are affected with leaf galls. The leaf galls occur strewed or in clusters resulting in the crumpling of the leaves. The higher infestation on leaf may lead to morphological deformities lowering the aesthetic value of Scholar tree *Alstonia scholaris* by forming galls on the foliage, which gives an unpleasant appearance to the tree thus destroying its beauty.

Albert *et al.* (2011) revealed that the nymph stage is the major cause of gall formation in various parts of the host plant which is in agreement of present findings. Krishnan *et al.* (2011) observed that *P.tuberculata* also causes galls on different parts of the plant *viz.*, leaves, stems, fruits and inflorescence. Arya *et al.* (1975) reported that growth of gall tissues are related with the biochemical changes in the levels of carbohydrates, proteins, nucleic acids, phenols, IAA and enzymes.

This study on the leaf gall of *A. scholaris* describes the infestation and damage symptoms induced by *P. tuberculata*. The gall insect is host plant specific and completes its major part of life cycle within the galls on tree. Though minor infestation doesn't harm the tree, but in case of severe infestation the leaves gets crumpled and disfigured. Therefore eco-friendly measure to manage leaf gall of *A. scholaris* should be taken to lower down the number of infections before it reaches severity and effects tree health.

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