Occurrence of stem fasciation in *Tinospora cordifolia* from Maharashtra, India

***Tinospora cordifolia* plant showing stem fasciation symptom (left), healthy plant (right).**
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Tinospora cordifolia (Willd.) Hook.f. & Thomson, is an herbaceous vine belonging to family Menispermaceae and is commonly known as Giloy, Guduchi or Heartleaf Moonseed. It is an important medicinal plant having several therapeutic properties and is widely used in traditional ayurvedic medicine. A wide range of active compounds including alkaloids, glycosides, diterpenoid lactones, sesquiterpenoid, steroids, and phenolics have been extracted from different parts of *T. cordifolia* (Upadhyay et al. 2010). The plant is of great interest for researchers across the globe as it is used in the treatment of several ailments such as diabetes, jaundice, urinary diseases, inflammation, rheumatism, anemia, allergic, skin and several other conditions (Srivastava & Singh 2021).

Fasciation is a condition of abnormal growth in vascular plants and is widely known to occur across the plant kingdom, having been documented in over 107 families (Brannon 1914). The term originates from the Latin '*fascis*' which means a 'bundle'. It usually manifests as a change in the morphology of the

plant organs and typically involves flattening of the stem, broadening of the shoot apical meristem and changes in phyllotaxy (Iliev & Kitin 2010). Although modification of the main plant axis is often the most prominent feature of fasciation, the condition has been observed to affect all plant parts.

The occurrence of this phenomenon is a concern in agriculture and horticulture as it can reduce the value of traded plants (Porbeni & Fawole 2013; Wilson et al. 2001). The fasciated plant parts such as fruits, flowers or stems may become severely deformed rendering them unmarketable.

During a plant diversity survey conducted in May 2025, an interesting natural occurrence of stem fasciation symptom was observed in *T. cordifolia* growing in a garden near the campus of Fergusson College, Shivajinagar, Pune, Maharashtra, India.

The fasciated *T. cordifolia* plant exhibited distinct morphological differences compared to the normal plants. The stem had changed from its typical circular shape seen in the normal plants to a broad, flattened, ribbed, ribbon-like structure which was unlike any other plant of the same species. The phyllotaxy was also found to be different with multiple leaves arising at the same nodal region. The leaves were also reduced in size with shorter petioles and internodal length.

A review of the existing literature revealed that stem fasciation in *T. cordifolia* association with phytoplasma infection has previously been reported from Bhadra Wildlife Sanctuary in the neighboring state of Karnataka (Achar et al. 2015). To the best of our knowledge, this is the first record of stem fasciation in *T. cordifolia* from Maharashtra.

Further studies are required to ascertain the cause of fasciation in the present case as this phenomenon can be induced by several biotic and abiotic factors (Iliev & Kitin 2010). The fasciation could most likely have occurred owing to a phytoplasma infection. It could also possibly be attributed to infection of a bacterium such as *Rhodococcus fascians,* which is known to cause fasciation in a wide spectrum of plant species (Park et al. 2021).

Other possible causes include damage to the growing tip, random genetic mutation, hormonal disturbances in meristematic tissues, environmental factors such as temperature variation, nutrient deficiency or nematode infestation (Omar et al. 2014). The impact of fasciation on the pharmaceutically important metabolites of *Tinospora* also needs to be investigated.

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