



# Pine Tortoise Scale



Pine tortoise scale (*Toumeyella parvicornis*) is a Nearctic pest of pine occurring from Mexico, throughout the United States (except the north-west) and into south-central Canada. It was first reported in Italy in 2015 and has spread to Abruzzo, Campania, Lazio and Apulia regions. In 2021 it was found in France Provence-Alpes-Cote d'Azur region. It is contributing to the decline and mortality of stone pine (*Pinus pinea*), particularly in urban areas. In the Caribbean it is a highly invasive pest and in recent decades it has decimated the native Caicos pine forests (*Pinus caribaea* var. *bahamensis*) in the Turks and Caicos Islands. It is not yet known how susceptible Scots pine is to *T. parvicornis* but it was not recorded on *P. pinea* until it was introduced to Italy.



## Hosts

Pine tortoise scale feeds exclusively on *Pinus* species (Pinaceae) including: Jack pine (*P. banksiana*), lodgepole pine (*P. contorta*), shortleaf pine (*P. echinata*), slash pine (*P. elliotti*), spruce pine (*P. glabra*), mugo pine (*P. mugo*), longleaf pine (*P. palustris*), stone pine (*P. pinea*), Scots pine (*P. sylvestris*), loblolly pine (*P. taeda*) and Virginia pine (*P. virginiana*).

## Biology/Description

Pine tortoise scale is highly adaptable to abiotic conditions; it has one generation per year in the northern limit of its range in Canada/NE United States, 3 in southern Italy, 3-4 in southern United States and breeds continuously under the tropical conditions in the Caribbean with >5 generations/year. It reproduces sexually and each adult female lays up to 1014 eggs, protected under the female body. Females have 3 immature stages prior becoming adults, while males have 4 immature stages (including pre-pupa and pupa). Crawlers, are oval, orange or reddish and have six legs (Fig. d). Older nymphs are pinkish, legless, oval, and convex (Fig. a). Adult females occur in two distinct forms being oval and strongly convex in shape when feeding on the bark (Fig. d), or elongate and moderately convex when on the needles (Fig. e). They are initially greenish (Fig. b), becoming reddish-brown with cream or dark brown speckles or stripes, and they may secrete large quantities of white powdery wax. Mature females are a uniform dark brown (Figs d-e). At times the adult females overlap each other on the twigs or needles. They attain a maximum length of 4.4 mm and width of 4 mm. The male wax tests (protective covers) are oval, white, translucent, and about 3.0 mm long (Fig. c). Adult males are winged and resemble small flies but are rarely seen.

The main natural dispersal stage is the 'crawler'. These wander over the host in search of a suitable feeding site where they attach and become sessile (except the adult males). Natural dispersal over longer distances is primarily by wind and phoresy (carried by other animals) whereas, international spread is most likely due to plant trade.



a) Immatures on *Pinus pinea*



b) Teneral adult females



c) Male wax test covered in a dry powdery wax



d) Bark-feeding adult females are globular. The small orange dots are first instars (crawlers).



e) Needle-feeding adult females. Elongated-oval and moderately convex.

## Symptoms

First signs of an infestation may be seen in early spring when the first generation starts to feed. The scales egest enormous quantities of honeydew which can give the pine tree a shiny appearance, particularly the bark. Thick black sooty moulds develop on the honeydew turning the bark and needles black (Fig. f). The ground and objects below the infestation can also turn black. New growth may turn white due to large quantities of wax secreted by the young females although this quickly disappears with wind and rain (Fig. g). There is also yellowing, needle loss and flagging (die back) indicating general decline in the health of the tree and eventually death (Fig. h).



f) *Pinus pinea* bark covered in sooty mould growing on honeydew excreted by Pine tortoise scale.

g) New growth in *Pinus caribaea* white due to a conspicuous covering of wax secreted by Pine tortoise scale



h) *Pinus pinea* infested with Pine tortoise scale showing needle loss.



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**Please note:** Any symptoms similar to those highlighted above will be reported by garden staff through: TreeAlert <https://www.forestresearch.gov.uk/tools-and-resources/fthr/tree-alert/> (GB) or Tree check <https://www.treecheck.net/twa-ui/#/public/report> (Northern Ireland)