

# *Pineus pini*

PINE WOOLLY APHID  
HEMIPTERA: ADELGIDAE



FOREST PEST SPECIES PROFILES  
MAY 2013



## MAJOR PEST OF PINE SPECIES WORLDWIDE.

Infestations of asexually-reproducing adelgid aphids belonging to the genus *Pineus* have been reported from many countries worldwide. Various names have been used in the literature including *Pineus pini*, *P. laevis* and *P. boernerii*. Currently there is no completely reliable method for identifying each of the species within this group (CABI, 2013). This pest sheet summarizes information on this group.



Adults and eggs  
(Credit: Plantwise.org/G.W. Watson)

## HOSTS

*Pinus* species, including *Pinus canariensis*, *P. caribaea*, *P. contorta*, *P. elliotii*, *P. halepensis*, *P. hartwegii*, *P. kesiya*, *P. massoniana*, *P. maximinoi*, *P. montezumae*, *P. mugo*, *P. muricata*, *P. oocarpa*, *P. patula*, *Pinus pinaster*, *P. pinea*, *P. radiata*, *P. resinosa*, *P. sylvestris*, *P. taiwanensis*, *P. teocote*, *P. thunbergii*.

## PATHWAYS

Dispersal is through crawling (first instar larvae can move a few metres) and wind. Longer distance spread is via the movement of infested nursery stock.

## DISTRIBUTION

**Native:** *P. pini* is native to Western and Central Europe; *P. boernerii* may be of eastern Asian origin (Blackman and Eastop, 1994). Records of these species from other countries represent introduced populations.

### Introduced:

**Africa:** Ethiopia, Kenya, Malawi, Morocco, South Africa, Tanzania, Zambia, Zimbabwe

**Asia and the Pacific:** Australia, China, Georgia, Malaysia, New Zealand, Pakistan

**Latin America and the Caribbean:** Argentina, Brazil, Chile

**Near East:** Israel, Jordan, Kyrgyzstan, Lebanon, Turkey

**North America:** USA

(Source: CABI, 2013)

## IDENTIFICATION

*Pineus* aphids are very small insects; morphological details are best studied at high magnification. The reddish-brown body is usually concealed within a tangle of white wax threads.

Wingless adult females are each 0.9-2.3 mm long, the body being ovoid to turberate. Adults are similar to the immature instars, being ovoid with dorsal segmentally arranged sclerotized plates ornamented with wax glands, and short legs and antennae concealed beneath the body. However, adult females possess an ovipositor and the antennae are proportionally very short, with only 1-3 segments that are often partly or completely fused together. There is greater fusion of dorsal plates in adults than in immatures, especially on the head and anterior parts of thorax.

Bodies of winged adult females are 1.0-1.9 mm in length and have a clearly divided head, thorax and abdomen, and well-developed legs and antennae. They possess an ovipositor. There are five antennal segments, with segments III, IV and V often bearing a single, large sensorium. Compound eyes are present.

Eggs are laid in a nest of white wax fibres secreted by the wax pores of the adult female. Each egg is fairly elongate-ovoid, about 0.2 mm long, and yellow when laid but gradually changes colour to brownish-red as the embryo develops.

First-instar crawlers are very small (each 0.2-0.4 mm long), reddish-brown, ovoid and wingless, with three pairs of legs and small, three-segmented setae; the last antennal segment bears a long apical seta. Eyes are represented only by three ocelli on each side of the head.

(Source: Carter, 1971).



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Infestation of young pine stem  
(Credit: Bugwood.org/3943035/W. Ciesla)

## SYMPTOMS AND DAMAGE

Infestation causes premature needle shedding and reduction in the length of infested needles, reducing productivity and leading to up to 50 percent loss of growth increment (Day *et al.*, 2003) and up to 20 percent tree mortality (Odera, 1974). Stress can make pine trees more vulnerable to attack (Madoffe and Austara, 1993; Day *et al.*, 2003). Damage to trees is most severe under warm, dry conditions (Mailu, Khamala and Rose, 1978a).

## BIOLOGY

Asexual reproduction by winged and wingless females occurs throughout the year; there are at least three overlapping generations annually. Clutches of eggs are laid (one egg at a time) over several weeks, resulting in considerable differences between the hatching times of the first and last eggs laid. There are five immature instars before an adult is produced. Overwintering is as wingless adult females (hiemosistentes) that are heavily sclerotized, and as second- and third-instar larvae. In spring, the larvae develop into wingless progredientes (the summer form of the adult female, which is lightly sclerotized) and winged females. (Source: Carter, 1971).

## CONTROL MEASURES

As stress can increase susceptibility, applying good forest health practices will help protect forests from infestations or decrease the severity of damage. Planting more resistant species or provenances may also be effective. *Pineus* aphids have been successfully controlled by introduced natural enemies, such as predatory species of *Leucopis* in particular *L. tapiae* and *L. nigriluna* in Hawaii (USA), predatory *Exochomus* spp. in Kenya, coccinellid beetles in Zimbabwe, and *Exochomus quadripustulatus* and *Diomus pumilo* in Australia.

## REFERENCES

- Blackman, R.L. & Eastop, V.F. 1994. *Aphids on the world's trees: an identification and information guide*. Wallingford, UK: CAB International.
- CABI. 2013. *Pineus pini* (pine woolly aphid). Invasive Species Compendium Datasheets. Available at: [www.cabi.org/isc/](http://www.cabi.org/isc/) (Accessed 20/05/13)
- Carter, C.I. 1971. Conifer woolly aphids (Adelgidae) in Britain. *Bull. For. Comm.*, 42: 51 pp.
- Day, R.K., Kairo, M.T.K., Abraham, Y.J., Kfir, R., Murphy, S.T., Mutitu, K.E. & Chilima, C.Z. 2003. Biological control of homopteran pests of conifers in Africa. *Pineus boernerii*. In: Neuenschwander P, Borgemeister C, Langewald J, eds. *Biological Control in IPM Systems in Africa*. Wallingford, UK: CAB Publishing, 104-106.
- Madoffe, S.S. & Austara, Ø. 1990. Impact of pine woolly aphid, *Pineus pini* (Macquart) (Hom., Adelgidae), on growth of *Pinus patula* seedlings in Tanzania. *Journal of Applied Entomology*, 110(4): 421-424
- Mailu, A.M., Khamala, C.P.M. & Rose, D.J.W. 1978. Evaluation of pine woolly aphid damage to *Pinus patula* and its effect on yield in Kenya. *East African Agricultural and Forestry Journal*, 43(3): 259-265.