# Oriental Chestnut Gall Wasp: New Nut Pest in North America

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**ABSTRACT.—** *Dryocosmus kuriphilus,* (Hymenoptera, Cynipidae), a recently discovered pest in the southeastern United States (Georgia) threatens the chestnut industry in this country. This oriental gall wasp attacks the vegetative buds and disrupts the shoot growth of the American chestnut, *Castanea dentata,* Chinese chestnut, *Castanea mollissima,* and Japanese chestnut, *Castanea crenata.* These gall wasps form galls that suppress shoot elongation and reduce fruiting; trees with severe infestations lose their vigor and often die.

## ECONOMIC IMPORTANCE

The cynipid gall wasp, ‹ Fig. 1), *Dryocosmus kuriphilus* Yasumatsu, threatens the chestnut industry of Japan and Korea ( Paik *et al.,* 1963; Shimura, 1972 ). Resistant trees have been obtained by breeding and selection, but another strain of the wasp has now developed that attacks these resistant trees ‹ Shimura, 1972 ). Late-ripening varieties of *Castanea crenata* Sieb. & Zucc., Japanese chestnut, tend to be more resistant than others. There is little resistance in *Castanea mollissima* Bl., Chinese chestnut.

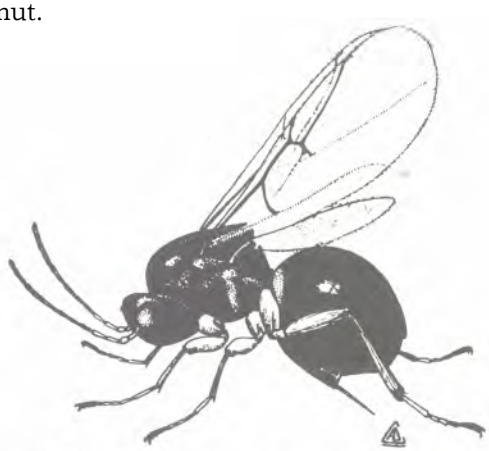

**Figure 1.** Adult chestnut gall wasp, *Dryocosmus kuriphilus.*

*Dryocosmus kuriphilus* was first reported in Japan in 1941 (Yasumatsu, 1951) and introduced into Korea in 1961. It attacks the vegetative buds and disrupts shoot growth through formation of a gall (Fig. 2). The galls suppress shoot elongation and reduce fruiting; trees with severe infestations lose their vigor and often die.

**Figure 2.** Round or knoblike rose-colored galls (8-15 mm in diameter) often appear earlier in the spring than normal buds.

There are few large chestnut groves in the United States, but small plantings consisting largely of seedling Chinese chestnuts exist in the Midwest, East, and Southeast (Jaynes, 1975). Chinese chestnut seedlings are offered for sale by most mail-order nurseries. In addition, approximately 100,000 chestnut seedlings are produced annually in state nurseries for distribution to landowners for wildlife and other planting purposes (Christisen, 1969).

## DISTRIBUTION

Infestation was first found in the United States in Peach County, Georgia, in 1974 ‹ Payne *et al.,* 1975). Approximately 30 acres of commerical grove and scattered yard trees were infested in Fort Valley, Georgia and a one-acre commercial grove was infested in Byron, Georgia. In 1976, infested trees

were found in three adjacent counties, Houston, Crawford, and Bibb.

## HOSTS

There are a large number of *Dryocosmus* species in the United States that infest oak, *Quercus* sp., and giant chinkapin, *Castanopsis* sp. ( Weld, 1951). *Dryocosmus kuriphilus* makes small ball-like galls on the species of *Castanea,* especially on Chinese chestnut, Japanese Chestnut, and the American chestnut, *Castanea dentata* ( Marsh. ) Borkh. Galls have not been found on the Allegheny chinkapin, *Castanea pumila* (L.) Mill. and the trailing chinkapin, *Castanea alnifolia* Nutt. although both species are growing adjacent to infested Chinese chestnuts.

## LIFE HISTORY

The wasp has one generation per year in Georgia and Korea. The early instar larvae overwinter inside the chestnut bud. In the spring when the chestnut buds (normally) begin to break, the gall wasp larva begins to mature rapidly and soon converts the bud into an 8-15 mm strawberry- or rose-colored gall (Fig. 2). The galls develop in early spring (early March), often 7-14 days before normal chestnut bud break. The larvae feed 20-30 days within the galls before pupating. Adult wasps, 3 mm long, begin emerging from the galls during the last week of May and the first week of June. Emergence is completed in approximately three weeks. Males appear to be unknown in this species ( Yasumatsu, 1951); only female wasps have been collected in Georgia and Korea. The female lays 3-5 eggs in a cluster inside the buds ( Paik *et al.,* 1963). More than one adult may oviposit in the same bud for some buds usually contain 10-25 eggs. The larvae hatch in 40 days, by late July; larval growth is very slow through the autumn and winter.

## DESCRIPTION

*EGG.*— Oval, milky white, 0.1-0.2 mm long. LARVA.-2.5 mm long when fully grown, milky white when newly hatched. PUPA. — Black, 2.5 mm long. ADULT (Fig. 1)-3 mm long; body black; legs (except last tarsal segment), scape and pedicel, clypeal apex, and middle of mandible yellow brown, frons and vertex of head weakly shining, very finely sculptured; scutum, side of scutellum, mesopleuron, and abdomen highly polished, impunctate; rest of body sculptured; scutum with two uniformly impressed convergent grooves (notaulices); marginal cell of forewing open along wing margin; female antenna with 14 segments, apical segments not expanded into a club. GALL. —Diameter 8-15 mm, greenish, often containing portions of developing leaves, stems, and petioles (Fig. 3). After adult emergence, the gall dries, becomes woodlike, and remains attached to the tree for several years ( Fig. 4).

**Figure 3.** Chestnut galls, 8-15 mm in diameter, containing portions of leaves and petioles. After the wasps leave, the galls die, dry, and become woodlike.

**Figure 4.** Dried galls sometimes remain attached to the shoot several years after departure of the gall wasps, thus making survey easy.

## CONTROL

Spread of the gall wasp occurs through the movement of infested twigs or shoots, or by flight of the adults during the two to three weeks they are present in May and June. Growers with a few chestnut trees and those not equipped to spray may reduce infestations by pruning chestnut shoots containing galls and then burning the shoots to prevent the gall wasp emergence.

Two parasites, *Torymus tubicola* ( Osten Sacken) and *Torymus advenus* ( Osten Sacken), of the chestnut gall wasp were reared from dried galls at Byron, Georgia in 1976. In 1977, parasites, *Torymus* sp., *Megastimus* sp., were collected in Japan and released at Byron in hopes of establishing a biological control.

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