

Plum curculio, *Conotrachelus nenuphar* (Herbst)

Introduction

The plum curculio, *Conotrachelus nenuphar* Herbst (Coleoptera: Curculionidae) is native to North America and is currently distributed across the north-eastern USA and Canada (EFSA 2020). It is not currently distributed anywhere outside of North America (EFSA 2020).

Plum curculio is an oligophagous pest primarily of stone and pome fruits as well as other Rosaceae (EFSA 2020). The preferred host plants are peaches, apricots and nectarines. Adult females damage the young fruits during oviposition resulting in scarring and wounding, and the feeding larvae cause premature fruit drop (EFSA 2020). Apples are also readily damaged by the adult females during oviposition, and fruits that do not drop early become deformed as they mature, even if the larvae do not survive, due to the wounds caused by the females during oviposition (Racette et al. 1992). Pears can also be deformed and scarred due to adult feeding and egg puncture wounds, but the larvae fail to develop within pear (CABI 2022). Overwintered adults perform maturation feeding on shoots and twigs, flower buds and leaves of host plants (EFSA 2020), and this can result in marginal damage to the leaves and blossoms (CABI 2022). Plum curculio is considered the second most serious pest of pome and stone fruit in eastern North America and can cause serious economic impact to apples and pears in its native range. Reports of up to 85% damage of harvested apples in unsprayed orchards in Quebec are recorded (Racette et al. 1992).

Control of *C. nenuphar* is difficult due to its development inside the fruit, unpredictable populations, and peak activity during bloom. Plant protection products applied against other orchard pests in Europe are also effective against plum curculio but only if the amount/number of treatments is increased (EFSA 2020). Furthermore, it is reported that populations of plum curculio can quickly (1-3 years) return to levels of economic importance if spraying is stopped (Racette et al. 1992). Biological control is employed using entomopathogenic nematodes.

All areas of pome and stone fruit production in the EU are considered at risk of establishment of this pest (EFSA 2020).

History of classical biological control against *Conotrachelus nenuphar*

There is no history of classical biological control against plum curculio as to date it has not been introduced into a country outside its native range.

Most promising natural enemies

A number of parasitoid natural enemies have been identified for plum curculio (Racette et al. 1992) but all are deemed inefficient at effectively controlling the pest (CABI 2022), but with little experimental evidence. Rates of parasitism are described as highly variable depending on location (Lampasona et al. 2020). Literature on the parasitoid species is scarce:

- *Anaphes* (*Anaphoidea conotrachelii*) (Hymenoptera: Mymaridae) is an egg parasitoid collected on two species of Curculionidae as well as a Tephritidae (Diptera) and an Argidae

Preparedness in biological control of priority biosecurity threats

(Hymenoptera) (Charlet and Balsbaugh 1984). Rates of parasitism on plum curculio range from 12-85% (Quaintance and Jenner 1912).

- *Neoaliolus rufus* (Hymenoptera: Braconidae) is a larval parasitoid with a reported rate of parasitism of 3% (Mampe and Neunzig 1967).
- *Neoaliolus curculionis* (Hymenoptera: Braconidae) is a larval parasitoid with reported rates of parasitism ranging from approximately 5% (Mampe and Neunzig 1967) an average of 20% in Ontario, and 37% in Florida (Vincent and Roy 1992; Lampasona et al. 2020).
- *Tersiochilus conotracheli* (Hymenoptera: Ichneumonidae) is a larval parasitoid with reported rates of parasitism ranging from 0.2-5.7% (Armstrong 1958)

Other natural enemies

Other parasitoids associated with plum curculio include the larval parasitoid *Triapsis kurtogaster* (Hymenoptera: Braconidae), only observed in Quebec, and three other larval parasitoids known to attack several species of weevil: *Bracon mellitor* (Hymenoptera: Braconidae), *Myophasia aeneae* (Diptera: Tachinidae), and *Cholomyia inaequipes* (Diptera: Tachinidae) (Racette et al. 1992).

References

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