

EPPO Datasheet: *Carposina sasakii*

Last updated: 2022-12-15

IDENTITY

Preferred name: *Carposina sasakii*

Authority: Matsumura

Taxonomic position: Animalia: Arthropoda: Hexapoda: Insecta: Lepidoptera: Carposinidae

Other scientific names: *Carpocapsa persicana* Matsumura, *Carposina persicana* (Matsumura)

Common names: peach fruit borer, peach fruit moth

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EPPO Categorization: A2 list

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EU Categorization: A1 Quarantine pest (Annex II A)

EPPO Code: CARSSA



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Notes on taxonomy and nomenclature

Carposina sasakii Matsumura was erroneously synonymized with *Carposina niponensis* Walsingham by Issiki in 1957. From then on, the name *Carposina niponensis* was used until Diakonoff differentiated the two species based on genitalia characters in 1989, and *Carposina sasakii* Matsumura had regained its original name. Hua (1992) and Li *et al.* (2001) stated that the species distributed in China is *Carposina sasakii* Matsumura, not *Carposina niponensis* Walsingham.

Carposina ottawana, that was once considered as subspecies of *Carposina niponensis*, is now considered a distinct species occurring in North America (Young & Robertson, 2020).

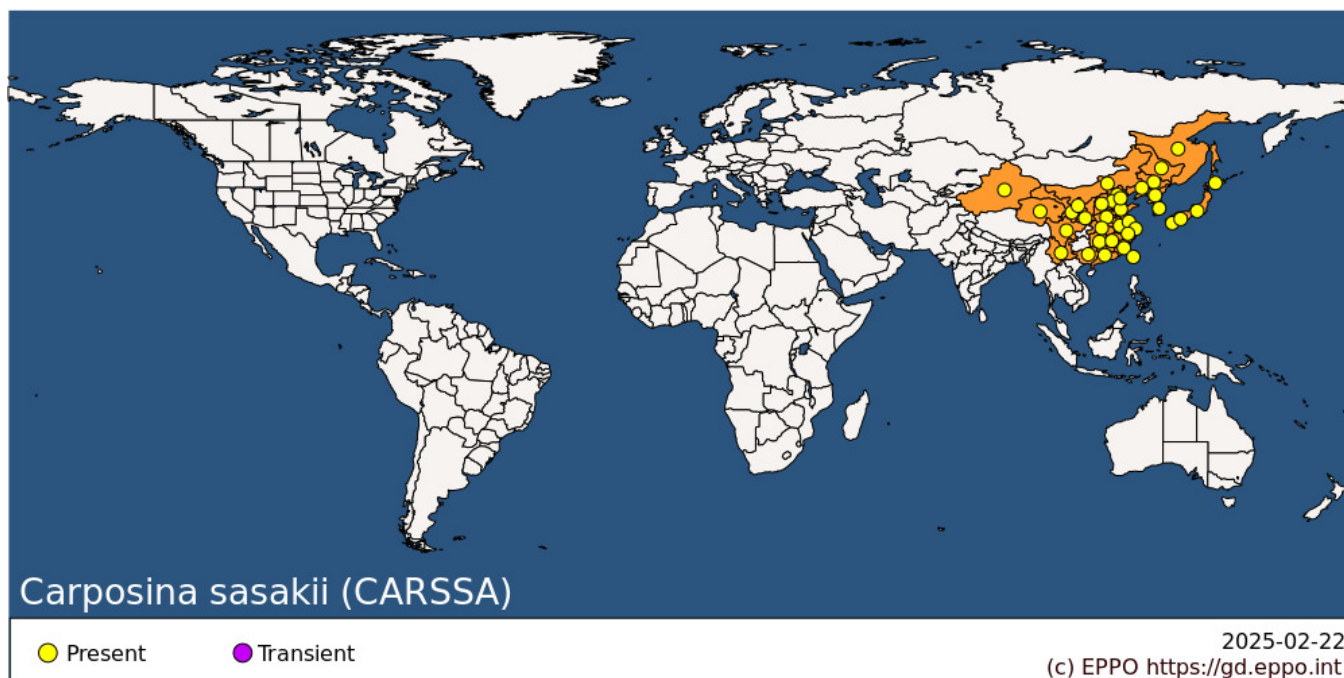
HOSTS

C. sasakii occurs on a range of cultivated and wild fruits, mainly Rosaceae. Jujube, apple and pear trees suffer the most serious damage (Hua & Hua, 1995; Wu & Huang, 2014).

Host list: *Chaenomeles japonica*, *Chaenomeles lagenaria*, *Crataegus cuneata*, *Crataegus pinnatifida*, *Crataegus*, *Cydonia oblonga*, *Malus domestica*, *Malus prunifolia*, *Malus spectabilis*, *Malus toringo*, *Malus x micromalus*, *Malus*, *Prunus armeniaca* var. *ansu*, *Prunus armeniaca*, *Prunus domestica*, *Prunus dulcis*, *Prunus mume*, *Prunus persica*, *Prunus salicina*, *Prunus*, *Pseudocydonia sinensis*, *Punica granatum*, *Pyrus communis*, *Pyrus pyrifolia*, *Pyrus*, *Sorbus commixta*, *Ziziphus jujuba*, *Ziziphus mauritiana*, *Ziziphus*

GEOGRAPHICAL DISTRIBUTION

C. sasakii occurs in temperate Far East Asia. Although it is present in the Far Eastern provinces of Russia, it does not occur in the European part or in Siberia and is a quarantine pest for Russia.



EPPO Region: Russia (Far East)

Asia: China (Anhui, Beijing, Fujian, Gansu, Guangdong, Guangxi, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Neimenggu, Ningxia, Qinghai, Shaanxi, Shandong, Shanghai, Shanxi, Sichuan, Tianjin, Xinjiang, Yunnan, Zhejiang), Japan (Hokkaido, Honshu, Kyushu, Shikoku), Korea Dem. People's Republic, Korea, Republic, Taiwan

BIOLOGY

C. sasakii overwinters as hibernating larvae in cocoons in the soil, though some larvae may overwinter in fruit in storage (Shutova, 1970). The development, reproduction, behaviour, emergence and diapause of *C. sasakii* are significantly affected by the environmental temperature, photoperiod (Lee *et al.*, 1963; Hwang *et al.*, 1976; Hou *et al.*, 1994; Li *et al.*, 2010; Toyoshima *et al.*, 2010; Zhao *et al.*, 2017) and by the different host species or varieties (Lei *et al.*, 2012; Li *et al.*, 2012). The life cycle can be univoltine or bivoltine. In northern China the completion of diapause occurs between late January and March (Zhang *et al.*, 2018). The larvae pupate in the spring in fresh cocoons on the surface of the soil and the moths emerge about 12 days later. The flight period starts in late May or early June in North Korea (Muramatsu, 1927) and ends in mid-June, with the second generation of adults flying from mid-August to early September. In China (Hwang, 1958), Japan (Yago & Ishikawa, 1936) and South Korea (Kim *et al.*, 2010), the overwintering larvae may pupate at any time between mid-May and late July, depending on soil temperature and soil humidity. *C. sasakii* larvae have higher emergence rates from the soil at moderate soil moisture levels (Ma *et al.*, 2017). The moths fly from mid-June until late September and there is considerable overlapping of generations. The second generation is only partial and first-generation larvae leaving the fruit in July may go into hibernation (Chang *et al.*, 1977).

Eggs are mainly laid on fruit, usually near the calyx end but some may be found near the stem end, or on the fruit stem. After hatching, the larvae crawl to the fruit surface and bore into the fruit (Chang *et al.*, 1977). Several eggs are laid on each fruit. Up to 20 larvae have been recorded in a single fruit (Yago & Ishikawa, 1936; Li *et al.*, 2019). One female can carry up to 350 mature eggs (Ohira, 1989) and lays an average of about 100 eggs (Gibanov & Sanin, 1971). The young larvae bore into the fruit, usually near the calyx, and feed on the inside of the fruit. Later, they may move from one fruit to another. Susceptibility to penetration by the young larvae varies with growth stage, species and cultivar of fruit. These factors (in addition to temperature) affect the rate of development of the larvae (Gibanov & Sanin, 1971; Chang *et al.*, 1977, Lei *et al.*, 2012).

DETECTION AND IDENTIFICATION

Symptoms

The larvae tunnel in all parts of the fruit, feeding on the fleshy parts and on the seeds. Several larvae may feed in each fruit. Infested apples exude a sticky gum, pears turn yellow, and apricots ripen unevenly (Gibanov & Sanin, 1971). Symptoms of infested fruit are the frass from larvae deposited on the fruit surface; fruit discolouration; abnormal shape, and a drop of fruit liquid that exudes from the entry site a day or two after larval penetration (Ishiguri & Toyoshima, 2006).

Morphology

Eggs

Elliptical, light yellowish-brown in colour with a granulated chorion. Bright red when freshly laid, and turn deep red as they age. Distinctive ring of spines round the apex, possibly encircling the micropyle (Wu & Hwang, 1955; Shutova, 1970; Kim & Lee, 2002).

Larva

Orange-red when newly hatched, changing to milky-white and then back to orange-red at maturity. Mature larva up to 13 mm long, with no anal comb. The setation is illustrated by Wu & Hwang (1955) and Lee *et al.* (2013).

Pupa

Reddish-brown, in cocoon.

Adult

Wingspan 13-19 mm. Long narrow forewings, mottled grey in colour, with a darker area along the anterior margin; hind wings with a fringe of long scales, and only five veins arising from the median cell. The genitalia have been illustrated by Wu & Hwang (1955), Ponomarenko (1999), Young & Robertson (2020). *C. sasakii*, *C. niponensis*, and *C. ottawana* cannot be separated reliably by external morphology and/or wing markings. Inspection of the genitalia is required for positive identification of adult specimens (Young & Robertson, 2020).

Detection and inspection methods

Eggs are mainly laid on the fruit, usually around the calyx. Using a hand lens (x10) will aid in detecting eggs (Chang *et al.*, 1977; Kim & Lee, 2002). Adults can be monitored with pheromone traps (Honma *et al.*, 1978; Liu *et al.*, 1981; Xue *et al.*, 2010; Lee *et al.*, 2014; Zhang *et al.*, 2017). Fruits that are suspected to be infested can be cut into halves for further inspection and detection of larvae. Cocoons or pupae can be found in soil.

Samples should be brought back to the laboratory for identification. The collected damaged fruits are packed in polyethylene plastic bags, and kept at a low temperature, sealed, moist and preserved. The samples should be identified as soon as possible, and the preservation time should not exceed 7 days.

Non-destructive technologies are being developed for detecting *C. sasakii* infestation in fruits such as magnetic resonance imaging (MRI) (Haishi *et al.*, 2011) but it is not known if this is used in practice.

Identification

Morphological identification of adults

The morphological characteristics, including the genitalia structure of the suspect adults collected in traps or reared from larvae following the on-site inspection, should be compared with those of the *C. sasakii* described above using a stereo microscope.

Morphological identification of larvae

The infested fruit should be dissected to collect the larvae, and the morphological characteristics of the suspect larvae should be compared with those of the *C. sasakii* described above using a stereo microscope. Larvae may be reared to adult stage by putting the infested fruit into a light incubator, under appropriate temperature, humidity and light conditions (e.g. 23°C, 80% HR, see Lei *et al.*, 2012). The morphological characteristics, including the genitalia structure of the adults should be checked for authentication.

Mass spectrometry (MALDI-TOF MS) may also be used (Jeon *et al.*, 2017).

Molecular identification methods

DNA markers applicable for identification of *C. sasakii* are available (Song *et al.*, 2007). A diagnostic multiplex polymerase chain reaction method can be used to identify *C. sasakii* (Hada *et al.*, 2011; Kwon *et al.*, 2018).

PATHWAYS FOR MOVEMENT

The moth normally flies only short distances. In China, 80% of marked adults dispersed randomly within a radius of 100 m and the furthest distance an adult dispersed was 225 m (Sun *et al.*, 1987) although flight mill studies showed that the moth can fly further (Ishiguri and Shirai, 2004, Gong *et al.*, 2020). Hence, international dispersal by flight is extremely unlikely. Larvae can survive for long periods in stored fruits, so imported fruits are the most likely means of entry. *C. sasakii* has never been found in an imported fruit consignment in the EU but is regularly found in the USA in fruit from Japan and South Korea (EFSA, 2018). It could also be introduced with the host plants for planting (as pupae in associated soil, or as larvae or eggs if the plants have fruits on them).

PEST SIGNIFICANCE

Economic impact

C. sasakii is considered one of the most important pests of pome fruits in the Far East. On apples in Japan, South Korea and China, it causes heavy losses if not managed and therefore control measures are usually applied in commercial orchards (Fand *et al.*, 2022; Hua *et al.*, 1996; Kawashima, 2008; Kim & Lee 2010). In the Primorye province of Russia damage to pears could reach 100% in some cases, but apples were less heavily infested (40-100%) (Sytenko, 1960; Pavlova, 1970; Gibanov & Sanin, 1971). It is also an important pest of jujube in China (Tung *et al.*, 1964; Zhang *et al.*, 2017), damage to jujube can reach 68% in some cases.

Control

Control of the pest can be successfully achieved by applying insecticides at the oviposition peaks of the first and second generations. Beta-cypermethrin (Quan *et al.*, 2017), cypermethrin, emamectin benzoate, phoxim, cyhalothrin, abamectin, monosultap, tebufenozide (Xiong, 2013), chlorbenzuron, flubendiamide (Gong *et al.*, 2016) and chlorantraniliprole (Gong *et al.*, 2016; Sun *et al.*, 2018) have been widely used to control *C. sasakii* in orchards, in combination with the mechanical removal of fallen fruit (Huan *et al.*, 1987).

Alternatives to insecticides exist, such as mating disruption (Kawashima, 2008; Lee *et al.*, 2014; Zhang *et al.*, 2017) or application of calcium carbonate or a bioactive plasticizer to limit oviposition (Kazama *et al.*, 2020, 2022). In China, fruits are bagged during the growing season to protect them from a range of fruit borers including *C. sasakii* (EFSA, 2018).

Chelonus (Microchelonus) zhangi, *Pristomerus chinensis* (Xu & Hua, 2009) and *Trichogramma dendrolimi* have been reported as parasites of *C. sasakii* (Fang *et al.*, 2022). The fungi *Beauveria bassiana* (Xiong *et al.*, 2013), *Isaria farinosa* (Li *et al.*, 2012), and *Metarhizium anisopliae* (Wang *et al.*, 2013) as well as entomopathogenic nematodes, such as *Steinernema feltiae* (Li *et al.*, 1993) and *Heterorhabditis* sp. (Li *et al.*, 1990) have been reported to be effective at controlling *C. sasakii* populations.

Phytosanitary risk

Pome and stone fruits are important crops in the EPPO region. Considering the current range of the pest, it is likely that *C. sasakii* could establish, spread and cause damage if it was introduced in the region. Integrated Pest Management (IPM) is applied for host fruits in the EPPO region and measures applied against other fruit pests (e.g. *Cydia pomonella*) may limit the impact of *C. sasakii* but IPM programmes would need to be modified to adapt them to *C. sasakii* (e.g. the timing of application of insecticides).

C. sasakii presents a risk to fruit production in most parts of the EPPO region. While it might only complete one generation per year in northern countries, it seems likely that a partial or complete second generation would be possible over much of Europe. The introduction of *C. sasakii* into the EPPO region could have a severe economic impact on the fruit-growing areas of the region and require modification of IPM practices.

PHYTOSANITARY MEASURES

Fruits of host plants from countries where the pest occurs should be free from the pest. This can be achieved if the fruits come from a pest-free area or by treating fruit consignments after harvest. Fruit irradiation is approved at international level (IPPC, 2022), other possible treatments are fumigation, cold treatment and modified atmosphere (Kim *et al.*, 2022; Son *et al.*, 2012). Alternatively, pest freedom may be achieved by a systems approach combining monitoring orchards during production and applying control measures or bagging fruits during the growing season, and inspection before export. It should be also ensured that fruit crates are free of pupating larvae and/or pupae.

Host plants for planting of countries where the pest occurs should come from a pest free area; or not carry fruits and be free from soil. It may be noted that the import of *Prunus* plants for planting is prohibited in many EPPO countries (EFSA, 2018).

REFERENCES

- Chang NX, Chang LY, Shi ZQ, Hwang KH (1977) [Studies on the biology of the apple fruit moth - influences of the fruits on the establishment, growth and diapause of the larvae]. *Acta Entomologica Sinica* **20**, 170-176.
- Diakonoff A (1989) [Revision of the Palaearctic Carposinidae with description of a new genus and new species (Lepidoptera: Pyraloidea)]. *Zoologische Verhandelingen* **251**, 1-155.
- EFSA Panel on Plant Health (PLH), Bragard C, Dehnen-Schmutz K, Di Serio F, Gonthier P, Jacques MA, Jaques Miret JA, Fejer Justesen A, Magnusson CS, Milonas P, Navas-Cortes JA (2028) Pest categorisation of *Carposina sasakii*. *EFSA Journal* **16**(12), 5516, 24 pp. <https://doi.org/10.2903/j.efsa.2018.5516>
- Fang SS, Qiao XF, Su S, Jian CZ, Chen MH (2022) [Advance of research in damage and control of *Carposina sasakii* Matsumura]. *Shaanxi Journal of Agricultural Sciences* **68**(7), 77-82.
- Gibanov PK, Sanin YuV (1971) [Lepidopteran pests of fruits in Primorskii province]. *Zashchita Rastenii* **16**, 41-43.
- Gong Q, Gong Y, Cao L, Zheng X, Pu D, Huang Q, Wei S (2020) Flight ability of the peach fruit moth, *Carposina sasakii* (Lepidoptera: Carposinidae), fed on different host plants. *Acta Entomologica Sinica* **63**(9), 1153-1158.
- Gong QT, Wu HB, Zhang KP, Sun LN, Sun RH (2016) Research of three insecticides' residual effect on oriental fruit moth and peach fruit moth. *Journal of Fruit Science* **33**(7), 857-864.
- Hada H, Sekine KT (2011) A diagnostic multiplex polymerase chain reaction method to identify Japanese internal apple-feeding Lepidopteran pests: *Grapholita molesta*, *Grapholita dimorpha* (Lepidoptera: Tortricidae), and *Carposina sasakii* (Lepidoptera: Carposinidae). *Applied entomology and zoology* **46**(2), 287-291.
- Haishi T, Koizumi H, Arai T, Koizumi M, Kano H (2011) Rapid detection of infestation of apple fruits by the peach fruit moth, *Carposina sasakii* Matsumura, larvae using a 0.2-T dedicated magnetic resonance imaging apparatus. *Applied magnetic resonance*

41(1), 1-18.

Honma K, Kawasaki K & Tamaki Y (1978) Sex-pheromone activities of synthetic 7-alken-11-ones for male peach fruit moths, *Carposina niponensis* Walsingham (Lepidoptera: Carposinidae). *Japanese Journal of Applied Entomology and Zoology (Japan)* **22**, 87–91.

Hou WW, Ma YF, Gao WZ, Li SW, Yan ZJ (1994) A study on the phototaxis of the peach fruit moth. *Acta Entomologica Sinica* **37**(2), 165-170.

Hua BZ (1992) [On the scientific name of the peach fruit borer]. *Entomotaxonomia* **14**, 313-314. (in Chinese)

Hua BZ, Zeng XH, Zhang H (1996) [Influences of apple maturity on the development and diapause of *Carposina sasakii* Matsumura]. *Acta Universitatis Agriculturae Boreali-Occidentalis* **24**(6), 35–38.

Hua L, Hua BZ (1995) Preliminary study on the host-biotypes of peach fruit borer. *Acta Phytophylactica Sinica* **22**, 165–170 (in Chinese).

Huan JL, Cheng XM, Zhou CB (1987) Infestation pattern of *Carposina niponensis* in plantations of *Ziziphus jujuba* and its control. *Plant Protection* **13**, 18-20.

Hwang KH (1958) Studies on the biology and chemical control of the apple fruit borer *Carposina niponensis*. *Acta Oeconomica-Entomologica Sinica* **1**, 31-66.

Hwang KH, Wang YZ, Ye ZX, Zhang NX, & Zhang LY (1976) Influence of photoperiod and temperature on diapause of the peach fruit moth *Carposina sasakii* Matsumura. *Acta Entomologica Sinica* **19**(2), 149-156.

IPPC (2022) ISPM 28 Phytosanitary Treatments, Annex 38 PT 38: Irradiation treatment for *Carposina sasakii*. Available at <https://www.ippc.int/fr/core-activities/standards-setting/ispms/>

Ishiguri Y, Shirai Y (2004) Flight activity of the peach fruit moth, *Carposina sasakii* (Lepidoptera: Carposinidae), measured by a flight mill. *Applied Entomology and Zoology* **39**, 127–131.

Issiki S (1957) Carposinidae. In: Esaki T *et al.*: *Icones Heterocerorum Japonicorum in Coloribus Naturalibus* 36.

Jeon JH, Oh HW, Yun CS, Byun BK, Park JJ, Park HS, Park DS (2017) Rapid and reliable species identification of *Carposina sasakii* from its morphological homologues, by MALDI-TOF mass spectrometry. *Journal of Asia-Pacific Entomology* **20**(2), 411-415.

Kawashima K (2008) Bionomics of the peach fruit moth *Carposina sasakii* Matsumura (Lepidoptera: Carposinidae). Bulletin of the Apple Experiment Station, Aomori Prefectural Agriculture and Forestry Research Center no. 35, 1-51.

Kazama H, Ohata Y, Ishiguri Y, Ono H, Mori N, Yoshinaga N (2022) Absolute stereochemistry of TXIB, a bioactive plasticizer that inhibits oviposition of the peach fruit moth, *Carposina sasakii* (Lepidoptera: Carposinidae). *Journal of Chemical Ecology* **48**(5), 583-587.

Kazama H, Oohata Y, Takanashi T, Tokoro M, Ishiguri Y, Mori N, Yoshinaga N (2020) Inhibitory substances contained in calcium carbonate wettable powder on the oviposition of the peach fruit moth, *Carposina sasakii*. *Journal of Pesticide Science* **45**(1), 16-23. <https://doi.org/10.1584/jpestics.D19-066>

Kim BS, Hong KJ, Kwon TH, Lee KY, Lee BH, Lee SE (2022) Phosphine fumigation followed by cold treatment to control peach fruit moth, *Carposina sasakii*, larvae on “Fuji” apples intended for export. *Applied Sciences* **12**(15), 7514. <https://doi.org/10.3390/app12157514>

Kim DS, Lee JH (2002) Egg and larval survivorship of *Carposina sasakii* (Lepidoptera: Carposinidae) in apple and peach and their effects on adult population dynamics in orchards. *Environmental Entomology* **31** (4), 686–692. <https://doi.org/10.1603/0046-225X-31.4.686>

Kim DS, Lee JH (2010) A population model for the peach fruit moth, *Carposina sasakii* Matsumura (Lepidoptera:

Carposinidae), in a Korean orchard system. *Ecological Modelling* **221**(2), 268-280.

Kwon DH, Kwon HK, Kim DH, Yang CY (2018) Larval species composition and genetic structures of *Carposina sasakii*, *Grapholita dimorpha*, and *Grapholita molesta* from Korea. *Bulletin of entomological research* **108**(2), 241-252.

Lee PC, Woo WC, Hwang KH (1963) A preliminary study on the effect of photoperiod and temperature on the induction of diapause in the peach fruit borer (*Carposina niponensis* Walsingham). *Acta Entomologica Sinica* **12**(4), 423-431.

Lee SY, Choi KH, Do YS, Lee SW, Yoon C, Kim GH (2014) Management of *Grapholita molesta* and *Carposina sasakii* using mating disruption in non-chemical or organic apple orchards. *Korean Journal of Applied Entomology* **53**(2), 103-110.

Lee SY, Choi KS, Choi KH, Yoon TM, Jung HY (2013) Morphological differences between larvae of the oriental fruit moth (*Grapholita molesta* Busck) and the peach fruit moth (*Carposina sasakii* Matsumura) in Korea. *Applied Microscopy* **43**(1), 21-26.

Lei XH, Li DX, Li Z, Zalom FG, Gao LW, Shen ZR (2012) Effect of host plants on developmental time and life table parameters of *Carposina sasakii* (Lepidoptera: Carposinidae) under laboratory conditions. *Environmental Entomology* **41**(2), 349-354.

Li DX, Lei XH, Li Z, Gao LW, Shen ZR (2012) Effects of different host plants on the development and reproduction of the peach fruit borer, *Carposina sasakii* Matsumura (Lepidoptera: Carposinidae). *Acta Entomologica Sinica* **55**(5), 554-560.

Li DX, Wang HW, Wang JY, Kang ZK, Dong JF, Shen ZR (2010) Life tables of the laboratory population of the peach fruit borer, *Carposina sasakii* Matsumura at different temperatures. *Acta Entomologica Sinica* **53**(7), 773-779.

Li HH, Wang YR, Dong JZ (2001) Systematic notes on Carposinidae of China, with descriptions of two new species (Lepidoptera: Copromorpha). *Acta Zootaxonomica Sinica* **26**, 61-73. (in Chinese)

Li J, Zhu YM, Xue JL, Xiong Q, Zhao F, Xie YP (2012) Virulence of the five strains of entomopathogenic fungi infected on the larvae of *Carposina sasakii*. *Acta Phytophylactica Sinica* **39**(6), 549-555.

Li SC, Liu JB, He DJ (1990) Studies on the utilization of entomopathogenic nematode Taishan 1 for peach fruit borer control. *Acta Phytophylactica Sinica* **17**(3), 237-240.

Li XF, Feng DD, Xue QQ, Meng TL, Ma RY, Deng A, Chi H, Wu ZY, Atl?han R, Men LN, Zhang ZW (2019) Density-dependent demography and mass-rearing of *Carposina sasakii* (Lepidoptera: Carposinidae) incorporating life table variability. *Journal of Economic Entomology* **112**, 255-265.

Li Y, Liu Z, Zhang GL, Chai F, Zong J (1993) The application of *Steinernema feltiae agriotes* against peach fruit borer. *Acta Phytophylactica Sinica* **20**(4), 337-342.

Liu MY, Zeng XN & Yan ZC (1981) Synthesis of the sex pheromones of the peach fruit moth– Z-7-eicosene-11-one and Z-7-nonadecene-11-one. *Acta Chimica Sinica* **39**, 475–480.

Ma G, Tian BL, Zhao F, Wei GS, Hoffmann AA, Ma CS (2017) Soil moisture conditions determine phenology and success of larval escape in the peach fruit moth, *Carposina sasakii* (Lepidoptera, Carposinidae): Implications for predicting drought effects on a diapausing insect. *Applied Soil Ecology* **110**, 65-72.

Muramatsu S (1927) Notes on the life histories and habits of four fruit moths in Chosen. *Journal of the Agricultural Experiment Station, Chosen* **16**, 1-37.

Ohira Y (1989) Numbers of spermatophores and mature eggs retained by field-collected female adults of the peach fruit moth, *Carposina niponensis*. *Journal of the Society of Plant Protection of North Japan* **40**, 165-166.

- Pavlova AP (1970) [The peach tortricid]. *Zashchita Rastenii* **15**, 54-55.
- Ponomarenko MG (1999) Review of the family Carposinidae (Lepidoptera) from Russian Far East. *Far Eastern Entomologist* **69**, 1-12.
- Quan LF, Qiu GS, Sun LN, Li YY, Yan WT, Yue Q, Zhang HJ (2017) Effects of sublethal concentrations of beta-cypermethrin on the biological characteristics of *Carposina sasakii* (Lepidoptera: Carposinidae). *Acta Entomologica Sinica* **60**(7), 799-808.
- Sato N, Ishitani M (1976) Life-cycle of the peach fruit moth, *Carposina niponensis* Walsingham. Bulletin of the Aomori Field Crops and Horticultural Experiment Station 1, 1-16.
- Shutova NN (1970) [The peach moth *Carposina sasakii*]. In: *Spravochnik po Karantinnym i Drugim Opasnym Vreditelyam, Boleznyam i Sornym Rasteniyam*, pp. 67-68. Kolos, Moscow, Russia.
- Son YR, Chon I, Neven L, Kim YG (2012) Controlled atmosphere and temperature treatment system to disinfest fruit moth, *Carposina sasakii* (Lepidoptera: Carposinidae) on apples. *Journal of Economic Entomology* **105**(5), 1540-1547.
- Song SB, Choi KH, Lee SW, Kim YG (2007) DNA markers applicable for identification of two internal apple feeders, *Grapholita molesta* and *Carposina sasakii*. *Korean Journal of Applied Entomology* **46**(2), 175-182.
- Sun LN, Tian ZQ, Zhang HJ, Li YY, Yan WT, Yue Q, Qiu GS (2018) Transcriptome analysis of disruption of mating in the peach fruit moth (*Carposina sasakii*) by chlorantraniliprole. *Scientia Agricultura Sinica* **51**(15), 2925-2936.
- Sun LQ, Zhang HQ, Li YY (1987) Studies on dispersal of sterile *Carposina niponensis* using mark-release-recapture technique. *Acta Agriculturae Nucleatae Sinica* **1**, 29-37.
- Sytenko LS (1960) [On the specific composition of fruit moths in Primorskii province]. *Revue Entomologique de l'URSS* **39**, 551-555. (in Russian).
- Toyoshima S, Arai T, Yaginuma K (2010) Effect of constant temperature on the development of peach fruit moth, *Carposina sasakii* (Lepidoptera: Carposinidae). *Bulletin of the National Institute of Fruit Tree Science* **10**, 1-8.
- Tung TC, Liu PL, Hwang KH (1964) Studies on the bionomics and control of the apple fruit borer, *Carposina niponensis* Walsingham, on Chinese date. *Acta Phytophylactica Sinica* **3**(4), 361-370.
- Wang G, Xiong Q, Tian F, Xie YP, Xue JL (2013) Isolation and Identification of a strain of *Metarhizium* and its virulence to *Carposina sasakii*. *Journal of Shanxi University (Natural Science Edition)* **36**(2), 275-281.
- Wu JJ & Huang PY (2014) *Main Pests Associated with Entry Fruits from Taiwan*. Beijing Science & Technology Press, China.
- Wu WC, Hwang KH (1955) [Identification of fruits moths damaging apple fruits]. *Acta Entomologica Sinica* **5**, 347-348.
- Xiong Q, Xie Y, Zhu Y, Xue JL, Li J, Fan RJ (2013) Morphological and ultrastructural characterization of *Carposina sasakii* larvae (Lepidoptera: Carposinidae) infected by *Beauveria bassiana* (Ascomycota: Hypocreales: Clavicipitaceae). *Micron* **44**, 303-311.
- Xu XL, Hua BZ (2009) Post-diapause development of *Carposina sasakii* Matsumura and its parasitoids. *Journal of Environmental Entomology* **31**(4), 327-331 (in Chinese with English abstract).
- Xue YH, Ma RY, Li XW, Li L & Li J (2010) Research and application on the sex pheromone of *Carposina sasakii* Matsumura (Lepidoptera: Carposinidae). *Chinese Journal of Biological Control* **26**, 211-216.

Yago M, Ishikawa H (1936) Ecological notes and methods of controlling the pear fruit borer *Carposina sasakii*. *Bulletin of the Shizuoka Agricultural Experiment Station* No. 39.

Young JD, Robertson JA (2020) Reinstatement of *Carposina ottawana* Kearfott, 1907 (Lepidoptera: Carposinidae) as a valid species. *Insecta Mundi* **0784**, 1-8.

Zhang ZW, Li XW, Xue YH, Zhao ZG, Li J, Ma RY (2017) [Increased trapping efficiency for the peach fruit moth, *Carposina sasakii* (Matsumura) with synthetic sex pheromone]. *Agricultural and Forest Entomology* **19**, 424-432.

Zhang ZW, Men LN, Wu ZY, Meng TL, Ma RY (2018) [Studies on fitness of *Carposina sasakii* Matsumura (Lepidoptera: Carposinidae) to different varieties of *Malus pumila* Miller apples]. *Journal of Shanxi Agricultural University (Natural Science Edition)* **38**, 1-7.

Zhao F, Li J, He RP, Kong WN, Xing K, Gao J (2017) Effects of key environmental factors on emergence dynamics of the larvae and the adults of peach fruit borer *Carposina sasakii*. *Journal of Plant Protection* **44**(3), 413-419.

ACKNOWLEDGEMENTS

This datasheet was extensively revised in 2022 by Zhiwei Zhang [College of Forestry, Shanxi Agricultural University, China]. His valuable contribution is gratefully acknowledged.

How to cite this datasheet?

EPPO (2025) *Carposina sasakii*. EPPO datasheets on pests recommended for regulation. Available online. <https://gd.eppo.int>

Datasheet history

This datasheet was first published in 1988 and revised in the two editions of 'Quarantine Pests for Europe' in 1992 and 1997, as well as in 2022. It is now maintained in an electronic format in the EPPO Global Database. The sections on 'Identity', 'Hosts', and 'Geographical distribution' are automatically updated from the database. For other sections, the date of last revision is indicated on the right.

CABI/EPPO (1992/1997) *Quarantine Pests for Europe (1st and 2nd edition)*. CABI, Wallingford (GB).

EPPO (1988) Data sheets on quarantine organisms No. 163, *Carposina niponensis*. *EPPO Bulletin* **18**(3), 543-547. <https://doi.org/10.1111/j.1365-2338.1988.tb00413.x>



Co-funded by the
European Union