Data Sheets on Quarantine Pests

Cacyreus marshalli

IDENTITY

Name: *Cacyreus marshalli* Butler
Taxonomic position: Insecta: Lepidoptera: Lycaenidae
Common names: Pelargonium butterfly (English)
Bayer computer code: CACYMA
EPPO A2 list: No. 181

HOSTS

Pelargonium spp. are the main host plants of this pest, which is also found on *Geranium* spp.

GEOGRAPHICAL DISTRIBUTION

The species is indigenous to southern Africa (Clark & Dickson, 1971). It was found in Spain (Mallorca, Balearic Islands) in 1988 and was first misidentified as *Lycaena boeticus* (Sarto i Monteys & Maso, 1991). It is now widespread on Mallorca and has been reported from Menorca and Ibiza (Sarto i Monteys, 1992). In 1993 it spread to the mainland, in the provinces of Alicante, Castellon, Valencia, Murcia and Logroño. In 1991, one adult specimen of *C. marshalli* was found in Belgium (Troukens, 1991).
EPPO region: Belgium (single record), Spain (Balearic islands - Ibiza, Mallorca, Menorca; mainland - Alicante, Castellon, Logroño, Murcia and Valencia).
Africa: Mozambique, South Africa, Zimbabwe.
EU: Present.

BIOLOGY

Little is known about the biology of *C. marshalli*, since the butterfly was first found in Europe in 1988 and only correctly identified in 1990 (Eitschberger & Stamer, 1990). It obviously did not cause significant enough losses in its indigenous area, southern Africa, to justify specific research.

After its discovery in Mallorca, the Plant Protection Service of the province of Cataluña started a research project on the biology of the pest (Sarto i Monteys & Maso, 1992). The newly hatched larvae move into a flower bud by piercing a hole through the sepals. They remain concealed in the flower buds and feed on the flower tissue, where they produce a cavity as a result of their feeding. On reaching the third instar, the larvae leave the flower bud by initiating a gallery into the stem. At 20°C, the larvae complete their development to pupae in about 30 days and the pupal stage lasts about 17 days (Sarto i Monteys & Maso, 1992). At lower temperatures, development is slower and it is assumed that the pest cannot overwinter in colder regions. At laboratory conditions of 20°C, no diapause has been observed and the generations follow each other continuously (Maso & Sarto i Monteys, 1991).

DETECTION AND IDENTIFICATION

Symptoms

The damage becomes most visible during the hot season when the larvae are most active. Flower damage is the most visible symptom. Flowers can be totally eaten by the larvae. Damage can be seen on flower peduncles and is often associated with secondary damage by microorganisms which can also colonize the tissue around the entry hole of the larvae into the peduncles (Sarto i Monteys & Maso, 1991).

Leaves may be partially eaten by the larvae but this symptom is less frequent and can be confused with feeding by snails (Sarto i Monteys & Maso, 1991). Eggs can be found on leaves and flowers. Seriously affected plants may die as a result of the infestation.

Morphology

Eggs

Whitish to light-yellow or brown in colour; 0.5 mm in diameter x 0.3 mm in height.

Larva

First-instar larvae have an average size of 1 mm which increases to 2 mm within 8 days. Second, 3rd and 4th instars grow to 3, 6 and 13 mm, typically in 8, 8 and 9 days, respectively. The colour varies, with extremes of yellow and/or greenish shades with or without pink markings (Clark & Dickson, 1971).

Pupa

Very hairy in shades of green, pale-yellow or brown, with brown mottling and an average size of 9 mm (Clark & Dickson, 1971).

Adult

Female adults have a wingspan of 18-27 mm while male adults have a wingspan of 15-23 mm. *C. marshalli* has a bronze-brown colouring of the upper surface with white spots on the fringe.

MEANS OF MOVEMENT AND DISPERSAL

The potential for natural spread is very low. The flight is short in duration, leisurely and interspersed with frequent rests. Eitschberger & Stamer (1990) therefore excluded the possibility that the introduction into Mallorca was due to natural dispersal. The most likely means of international dispersal is the movement of infested plant material, since larvae cannot easily be detected because of their habitat within the stem.

PEST SIGNIFICANCE

Economic impact

Little is known on the economic importance of this pest in its indigenous area. In Mallorca, 99% of pelargoniums are reported to be affected by *C. marshalli* (Sarto i Monteys & Maso, 1991). The pest rapidly spread to the other Balearic Islands (Sarto i Monteys, 1992). Following outbreaks on the Spanish mainland, the Spanish Plant Protection Services took measures to ensure that the pest was satisfactorily controlled in commercial nurseries. It is mainly damaging on garden and house pelargoniums.

Control

According to the Spanish Plant Protection Service, *Bacillus thuringiensis*, diflubenzuron, flufenoxuron, hexaflumuron, lambda-cyhalothrin, alphamethrin and benfuracarb are efficient insecticides for the control of *C. marshalli*. In Mallorca, no parasites have been found (Sarto i Monteys, pers. comm.). In South Africa, *Apanteles* spp. have been reported to kill third-instar larvae of the pest (Clark & Dickson, 1971).

Phytosanitary risk

C. marshalli is on the EPPO A2 quarantine list, but has not been regarded as a quarantine pest by any other regional plant protection organization. The example of the rapid establishment of *C. marshalli* on Mallorca, and its spread to the Spanish mainland shows that the pest has potential to establish in the Mediterranean basin and can be considered as a real danger for the European mainland. Pelargoniums are extensively grown as ornamental plants almost throughout Europe, but Spain, France and Italy, as well as North Africa, are at the greatest risk since their climatic conditions would allow the pest to overwinter outdoors. Furthermore, breeding and propagation of pelargoniums plays an important economic role in this region. Elsewhere in Europe, the pest could establish in glasshouses (Baufeld, 1993).

PHYTOSANITARY MEASURES

While the pest has a very restricted distribution in Europe, great vigilance is needed to prevent its establishment in new areas. Planting material should be obtained from areas free from the pest. If *C. marshalli* enters and establishes in an area, it may be very difficult to ensure that nurseries producing pelargonium planting material can be certified free from the pest.

BIBLIOGRAPHY

Baufeld, P. (1993) [Pest risk analysis of *Cacyreus marshalli* from a phytosanitary point of view]. *Nachrichtenblatt des Deutschen Pflanzenschutzdienstes* **45**, 257-262.

Clark, G.C.; Dickson, C.G.C. (1971) *Life histories of the South African lycaenid butterflies*, pp. 60-61. Purnell, Cape Town, South Africa.

Eitschberger, U.; Stamer, P. (1990) [*Cacyreus marshalli*, a new species of butterfly for the fauna of Europe?]. *Atalanta* **21**, 101-108.

Maso, A.; Sarto i Monteys, V. (1991) [A butterfly threatens European pelargoniums]. *Ciencia y Tecnología* 23 Noviembre 1991, p. 9.

Sarto i Monteys, V.; Maso, A. (1991) [Confirmation of *Cacyreus marshalli* as a new species for the fauna of Europe]. *Boletin de Sanidad Vegetal, Plagas* **17**, 173-183.

Sarto i Monteys, V.; Maso, A. (1992) Remarks on the biology of a lycaenid butterfly, pest of pelargoniums, new to Europe (Lycaenidae). *VIII European Congress of Lepidopterology*, Helsinki, 19-23 April 1992.

Troukens, W. (1991) [Cacyreus marshalli found in Belgium]. *Phega* **19**, 129-131.