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## Redescription of immatures and bionomy of the Palearctic species *Dicladispa testacea* (Linnaeus, 1767) (Coleoptera: Chrysomelidae: Cassidinae: Hispini), a leaf-mining hispine beetle

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### Abstract

*Dicladispa testacea* (Linnaeus, 1767) is a member of the tribe Hispini Gyllenhal, 1813 associated with plants of the family Cistaceae Juss. and is widely distributed in the Mediterranean Basin. Immature stages are described in detail, including line drawings, chaetotaxy, sculpture of integument, and SEM photos of morphological details. This is the first detailed description of immatures in the tribe Hispini, and this can be regarded as a model description for studies of other species in the tribe. Diagnostic characters for this species in comparison with other described larvae and pupae of the genus *Di-cladispa* and the sympatric *Hispia atra* Linnaeus, 1767 are discussed. Some remarks on the biology of *Di-cladispa testacea*, such as host plants, feeding patterns of adults, structure of larval and pupal mines, are also given.

**Key words:** morphology, immature, larva, pupa, Coleoptera, Chrysomelidae, Cassidinae, *Di-cladispa testacea*, *Cistus* sp., Mediterranean region

### Introduction

The leaf beetle genus *Di-cladispa* Gestro, 1897 is a member of the speciose tribe Hispini Gyllenhal, 1813 (Chrysomelidae: Cassidinae) and comprises 125 species occurring mostly in tropics and subtropics of the Old World with a few species in the warm parts of the Palearctic Region (Staines 2012). Six of them occur in the western Palearctic, especially in the Mediterranean subregion and the Middle East (Borowiec & Sekerka 2010). The most widely distributed species is *Di-cladispa testacea* (Linnaeus, 1767) recorded from Europe: Albania, Bulgaria, Croatia, France, Greece, Italy, Portugal, Spain, Switzerland, European part of Turkey, Serbia and Montenegro; from North Africa: Algeria, Morocco, Tunisia; and from Asia: Syria and Turkey (Borowiec & Sekerka 2010).

*Di-cladispa testacea* is associated with plants of the family Cistaceae Juss., especially the genus *Cistus* Linnaeus. Like other members in the tribe Hispini larvae, are leaf-miners and the whole life cycle is completed on the leaves of plants belonging to *Cistus*. The following species of *Cistus* were reported as food plants: *Cistus albidus* L. (Lesne 1906; Gestro 1919; Magistretti & Ruffo 1959), *C. albidus crispus* Del. (Grandi 1935), *C. florentinus* Lam. (Grandi 1935), *C. hirsutus* Lam. (Grandi 1935), *C. incanus* Rch. (Grandi 1935), *C. ladanifer* L. (García-Ocejo *et al.* 1992), *C. monspeliensis* L. (Lesne 1906; Gestro 1919; Buhr 1930; Magistretti & Ruffo 1959; Hering 1967), *C. salvifolius* L. (Laporte & Laporte 1852; Lesne 1906; Gestro 1919; Frost 1924; Needham *et al.* 1928; Maulik 1937; Magistretti & Ruffo 1959; Hering 1967), and *C. villosus* L. (Amsel & Hering 1931; Magistretti & Ruffo 1959; Hering 1967). Biondi *et al.* (1995) noted that it is associated also with other Cistaceae genera such as *Halimium* (Dunal) Spach and *Helianthemum* Mill., but without giving references, they also noted that adults were found in leaf litter under trees of *Pistacia lentiscus* L. (Anacardiaceae).

Although *Di-cladispa testacea* has a relatively large distribution area, and the host plants of this species are common in the Mediterranean subregion and were reported by various authors, different immatures stages of

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