

MONOLEPTA APICALIS (SAHLBERG) (COLEOPTERA: CHRYSOMELIDAE): A NEW ADDITION TO THE AVOCADO PEST COMPLEX

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ABSTRACT

*A severe outbreak of chrysomelid beetles in avocado orchards in the Kiepersol region was observed during the first week of January 1993. The beetle was identified as *Monolepta apicalis* (Sahlberg). The status of leaf beetles in South Africa is discussed and the genus *Monolepta* is partly reviewed with specific reference to African localities and/or avocado crops. Food/host plants and natural enemies of the beetle are listed.*

STATUS OF LEAF BEETLES IN SOUTH AFRICA

Chrysomelids, or leaf beetles, are phytophagous insects known to feed on a wide range of host plants, from lawn grasses and ornamental shrubs to large plantation trees such as bluegum and pine (Annecke & Moran, 1982; Silfverberg, 1989). In South Africa, leaf beetles have been recorded as pests on many cultivated crops, including cabbages (Cruciferae), cotton (Malvaceae), beetroot (Chenopodiaceae), gooseberries (Saxifragaceae), brinjal, tobacco and potatoes (Solanaceae) (Hill, 1979; Annecke & Moran, 1982). However, most of these crops are cultivated on a small scale and leaf beetles have not been considered important pests. As a result, very little is known about their biology and control measures have been seldom required. No record of *Monolepta apicalis* (Sahlberg) was found in Annecke and Moran's (1982) extensive coverage of insect pests on crops in South Africa.

THE GENUS *MONOLEPTA*

Monolepta is one of the largest genera of the subfamily Galerucinae and has a wide distribution in the tropical and subtropical regions of the world. In southern Africa, some 30-40 species are known (Silfverberg, 1989; B. Grobbelaar, personal communication). The following *Monolepta* species have been recorded on subtropical fruit crops: *M. australis* and *M. mashonana* were recorded as minor pests of citrus in Australia and southern Zimbabwe (formerly Rhodesia) respectively (Ebeling, 1959), and *M. bifasciata*, *M. lepida* and *M. australis* were listed as pests of avocados in the Philippines, Israel and Australia respectively (Ebeling, 1959; Smith, 1973; Wysoki & Izhar, 1978; Sarooshi *et al.*, 1979).

M. apicalis, or avocado beetle for want of a common name, is indigenous to the southern African region and has been reported from Antigo Congo Belga (14°46'S 40°18'E) and Bengo (19°04'S 33° 37'E) in Mozambique, and from Huambo (12°45'S 15°40'E) in Angola (Ferreira 1963; 1965). *M. apicalis* was also reported from the Ivory Coast when Balazuc (1988) isolated a parasitic ascomycete fungus (Laboulbeniales) from the beetle. Weise (1914) lists *M. apicalis* as having two aberrations viz. ab. *praeclara* and ab. *sahlbergi*, but neither he nor Ferreira (1963; 1965) list any host plants.

In Australia, *M. australis* has been reported on in detail. The life history and immature stages were studied by Murray (1982) and Houston (1982) respectively. Treverrow (1986) provides notes on the recognition, biology, food plants, injuriousness, and control of *M. australis* and Fay & DeFaveri (1990) discuss the effect of the beetles on avocado fruit set and their role as potential pollinators.

MONOLEPTA APICALIS ON AVOCADOS IN SOUTH AFRICA

The pest potential of the avocado beetle, *M. apicalis*, was evident in the beginning of January 1993 when beetles invaded avocado orchards on farms in the Kiepersol region of the eastern Transvaal and attacked fruit of the Hass, Fuerte, and Edranol cultivars. This was the first recording of beetle populations of this magnitude in avocado orchards in South Africa. Erichsen & Schoeman (1992) have previously reported damage to avocado fruit by beetles throughout the Nelspruit/Hazyview region (at that stage the beetle had not been identified). Fruit of all cultivars were attacked by the beetle, but most often only to a limited extent, and were still suitable for the local market. The beetles have been observed in avocado orchards since the 1991 season (C. Erichsen, personal observation), but were most likely also present in previous seasons. Hass orchards at Westfalia and Zebediela Estates were examined in January 1993 for the presence of beetles. *M. apicalis* as well as other chrysomelid species were found at Westfalia, but damage to fruit was negligible. No Chrysomelids injurious to avocados were found at Zebediela.

HOST PLANTS

Murray (1982) reported from Australia that avocados, citrus, macadamia, and mangos are hosts "favoured" by *M. australis*. Larval hosts include kikuyu (*Pennisetum clandestinum* Hochstetter ex Chiovenda), elephant grass (*Pennisetum purpureum* Schumacher), paspalum (*Paspalum dilatatum* Poiret), maize (*Zea mays* L.), sugarcane (*Saccharumoffidnarum*L)(Gramineae), white clover (*Trifolium repens* L.) (Leguminosae), and ginger (*Zingiber officinale* Roscoe) (Zingiberaceae) (Goodyer, 1982; Murray, 1982; Crosthwaite, 1983). Larvae of *M. australis* overwintered on sugarcane and gave rise to the first beetle swarm found in spring (Murray, 1982).

M. apicalis and other unidentified Chrysomelids (possibly also *Monolepta* species B. Grobbelaar, personal communication) were observed feeding on a number of plants found growing alongside and/or within avocado orchards (Table 1). Whether the beetle is able to complete its life-cycle on all of these plants has not been established and

some observations may have been a result of incidental occurrence. Damage to leaves and fruit of the indigenous sweetberry tree (Afrikaans: Mitserie/Bruinstinkhout) (Table 1), however, was more extensive than that found on avocado and is most likely the preferred host for some of these beetles. Legumes (grown as a cover crop) (Table 1) and grasses would provide larvae with sufficient nitrogen for rapid development, which would facilitate a large, healthy adult population. Chrysomelids have been reported as serious pests on legumes in Nigeria, India, Russia, and Australia (Turner, 1980; Nigeria, 1982; Kulikova, 1983; AN, 1988).

Locally, beetles were also found feeding on litchi and macadamia leaves, but damage to fruit has not been observed. *M. apicalis* was attracted in large numbers to flowers of various *Acacia* species (C. Erichsen, personal observation). Acacias flower a number of times between November and February (Coates-Palgrave, 1985), the frequency of which is dependent on rainfall, although flowering on individual trees may alternate between years. The period and volume of flowering can thus be affected by drought and the availability of food may be limited. Such an effect would induce the beetles to find alternate food sources such as avocado.

TABLE 1 Host plants on which *Monolepta apicalis* (Sahlberg) and unidentified chrysomelid species were found (* N. Claasens, personal communication).

HOST PLANT (COMMON NAME)	SITE FOUND
<i>Bridelia macrantha</i> (Sweetberry)	Westfalia Kiepersol
<i>Acacia</i> species(Thorn trees)	Kiepersol
<i>Phaseolus</i> species(Velvet bean)	Westfalia Kiepersol
<i>Protea</i> species*	Kiepersol
<i>Hibiscus trionum</i> *(Bladderweed)	Kiepersol
<i>Sida rhombifolia</i> *(Arrowleaf sida)	Kiepersol
<i>Triumfetta rhombodea</i> *	Kiepersol

NATURAL ENEMIES

Murray (1982) found parasitism of *M. australis* by *Monoleptaphaga caldwelli* Baranov (Tachinidae: Diptera). Levels of parasitism were less than 1.5% and were unlikely to have had a significant effect on the beetle populations. No entomo-parasites of *M. apicalis* have been recorded in South Africa.

Balazuc (1988) isolated from *M. apicalis* a parasitic ascomycete fungus, *Laboulbenia monoleptae* (Laboulbeniales), from the Ivory Coast. Although the fungal genus is generally monoecious with strict host specificity, the fungus does not have a marked effect on the health and vitality of the beetle.

CONCLUSION

Although damage to avocado cultivars by beetles has been reported previously (Erichsen & Schoeman, 1992), nothing is known of the habits or life history of *M. apicalis*. Attention should be given to improving knowledge on the beetle and on other potential chrysomelid pests. The presence and role of natural enemies also requires investigation.

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