

**NEW HOST PLANT ASSOCIATIONS AND DISTRIBUTION RECORDS  
FOR TORTOISE BEETLES (COLEOPTERA: CHRYSOMELIDAE: CASSIDINAE)  
FROM SOUTHERN AFRICA**

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**Abstract**

New host or distribution records are presented for 14 species of tortoise beetles from South Africa and Zimbabwe: *Aspidomorpha haefligeri* Spaeth, *A. tecta* Boheman, *Cassida ancorifera* Boheman, *C. circumflexa* Spaeth, *C. dorsovittata* Boheman, *C. innotata* Boheman, *C. lacrymosa* Boheman, *C. lueboensis* Spaeth, *Chiridopsis nigrosepata* Fairmaire, *Lacoptera cicatricosa* (Boheman), *Notosacantha badia* (Boheman), *N. junodi* (Spaeth), *N. nervosa* (Spaeth), and *N. vogeli* (Weise). *Cassida circumflexa* Spaeth, collected in Zimbabwe, was previously only known from the type locality along the coast of Mozambique.

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Approximately 90 species of tortoise beetles (Chrysomelidae: Cassidinae) are known from southern Africa (Scholtz and Holm 1985). Both larvae and adults are phytophagous, but few tortoise beetle host plants are known. Gressitt (1982), commenting on the insect fauna of New Guinea, stated that only a small fraction of the fauna could be discussed and although the paucity of ecological data was regretted, it clearly demonstrated the need for more research. This situation is not dissimilar in southern Africa where many ecological relationships between insects and plants are not well known.

Jolivet and Hawkeswood (1995) and Heron and Borowiec (1997) encouraged entomologists to record chrysomelids with their associated hosts so that ecological relationships could be better understood. Tortoise beetles are poor flyers and adults have the tendency to adhere to plants on which they are feeding, dropping to the ground when disturbed only as a last resort (Jolivet and Hawkeswood 1995). This sedentary behavior facilitates the collection of cassidines with their host plants and thereby increasing the knowledge of this beetle subfamily.

This paper presents new ecological data for tortoise beetles collected in South Africa and Zimbabwe mostly during the dry season. Presented are host records for eight species of adult tortoise beetles and new distribution records for 10 species of beetles from Zimbabwe.

**Materials and Methods**

In 1998 the author collected adult tortoise beetles from vegetation along the eastern coast of South Africa and throughout Zimbabwe. Most collections were made in Zimbabwe during the dry season from early May to mid November. The two exceptions were *Notosacantha badia* (Boheman) from South Africa and *Lacoptera cicatricosa* (Boheman) which were collected after the seasonal rains had begun. No rain occurred in the immediate Harare area after April 30 until October 18–19, 1998 when two brief showers fell. The persistent seasonal rains did not begin in Harare until November 18, 1998.

Collecting locations were determined for most beetle species using a Pioneer® global positioning system (GPS) and recorded as longitude and latitude to the

nearest second. However, prior to May 1, 2000, standard GPS receivers had an error budget of 50 m for horizontal measurements (Hurn 1993) so location data should be considered accordingly.

Host plant species were determined by collecting leaves and stems from beetle-associated foliage. Plants were identified by C. Chipano and Z. Tsvuura, National Herbarium, Ministry of Agriculture, Harare, Zimbabwe. No plant voucher specimens were retained by the herbarium. Beetles were identified by L. Borowiec, University of Wroclaw, Poland. Tortoise beetle voucher specimens are deposited in the insect collection at Texas A&M University, College Station, Texas (TAMU) and the collection of L. Borowiec.

## Results and Discussion

### *Aspidimorpha haefligeri* Spaeth

**New host record:** ZIMBABWE, 40 km N Mhangura, Chipiri estate lake, 16°37'31"S, 30°06'42"E, 19-IX-1998, two adults. Beetles were taken on leaves of *Brachystegia boehmii* Taub., Fabaceae. Jolivet and Hawkeswood (1995) record this Old World genus from four plant families, Asteraceae, Convolvulaceae, Lamiaceae, and Verbenaceae, and accidentally from seven additional plant families, with no record of their occurrence on Fabaceae. In South Africa, Heron and Borowiec (1997) recorded five species of *Aspidimorpha* exclusively from Convolvulaceae.

### *Aspidimorpha tecta* Boheman

**New country record:** ZIMBABWE, 21 km SE Mutare, Eden Lodge, 7-IX-1998, two adults. Beetles were collected at this Eastern Highlands location from an unidentified Fabaceae tree species. This beetle has been recorded from Namibia and South Africa (Borowiec 1999). This collection extends the range northeast of its known distribution.

### *Cassida ancorifera* Boheman

**New host and country records:** ZIMBABWE, Mazowe Dam, 17°31'06"S, 30°59'13"E, 19-VI-1998, one adult on *Duosperma crenatum* (Lindau), Acanthaceae; same location, 14-VII-1998, one adult on *Celtis africana* Burm. Ulmaceae; same location, 19-VII-1998, one adult on *Acokanthera oppositifolia* (Lam.), Apocynaceae. A fourth adult was collected 40 km N Mhangura, Chipiri estate lake, 16°37'31S, 30°06'42"E, 19-IX-1998, on newly-developing leaves of *Brachystegia spiciformis* Harms, Fabaceae. The collection of four adults on four different families of plants suggests *C. ancorifera* utilizes a variety of hosts to sustain itself during the dry season. Borowiec (1999) records this small species from Ethiopia, Equatorial Guinea, Malawi, Republic of Central Africa, Sierra Leone, Tanzania, and Zaire (=Democratic Republic of the Congo). The collection of this species in Zimbabwe extends the known range several hundred kilometers southward on the African continent.

### *Cassida circumflexa* Spaeth

**New country record:** ZIMBABWE, Mazowe Dam, 17°31'06"S, 30°59'13"E, 16-IX-1998, one adult beaten from woody vegetation along the Mazowe River. Borowiec (in litt.) states that this species was previously known only from the type specimen which was collected in Mozambique at Port E. A., Chibababa, on the Lower Buzi River (Borowiec 1999). The collection in Zimbabwe represents a new country record and extends the range west of its previously known distribution.

*Cassida dorsovittata* Boheman

**New country record:** ZIMBABWE, 21 km W Centenary, Miware Raffia Palm Reserve, 26-VIII-1998, one adult beaten from woody vegetation. This species has previously been collected from Equatorial Guinea, to Kenya and Somalia in the east, and south to Zambia and South Africa (Borowiec 1999).

*Cassida innotata* Boheman

**New country record:** ZIMBABWE, 20 km W Chipinge, Kiledo Lodge, 20°06'44"S, 32°45'22"E, 28-XI-1998, one adult. This species is widespread and has been collected in numerous central and southern African countries including Botswana, Ethiopia, Kenya, Malawi, Namibia, South Africa, Tanzania, Uganda, Zaire, and Zambia (Borowiec 1999).

*Cassida lacrymosa* Boheman

**New host and country records:** ZIMBABWE, Mazowe Dam, 17°3'06"S, 30°59'13"E, 19-VI-1998, three adults on *Duosperma crenatum* (Lindau), Acanthaceae; and 40 km N Mhangura, Chipiri estate lake, 16°37'31"S, 30°06'42"E, 19-IX-1998, one adult on *Brachystegia spiciformis* Harms, Fabaceae. Borowiec 1999 recorded this species from Mozambique, Namibia, South Africa, and Tanzania.

*Cassida lueboensis* Spaeth

**New country record:** ZIMBABWE, km peg 43 N Harare, 17°28'55"S, 30°59'12"E, 7-XI-1998, one adult. Borowiec (1999) recorded this species from the more equatorial countries of Ethiopia, Kenya, Nigeria, Uganda, and Zaire. This collection extends the known distribution into southern Africa.

*Chiridopsis nigrosepta* Fairmaire

**New country record:** ZIMBABWE, km peg 43 N Harare, 17°28'55"S, 30°59'12"E, 7-XI-1998, one adult, and Mazowe Dam, 17°31'06"S, 30°59'13"E, 20-VI-1998, one adult. It has previously been found in Angola, Ethiopia, Kenya, Tanzania, Zaire, Zambia (Borowiec 1999).

*Laccoptera cicatricosa* (Boheman)

**New host record:** ZIMBABWE, 12 km NE Chipangayi, 20°05'31"S, 32°37'26"E, 29-XI-1998, four adults. All specimens were taken from upper leaves of *Astripomoea lachnosperma* (Choisy), Convolvulaceae, which was growing along a roadside. This species has been recorded from five Convolvulaceae genera but only on *Convolvulus*, *Hewittia*, *Ipomoea*, *Merremia*, and *Calystegia* (Jolivet and Hawkeswood 1995; Heron and Borowiec 1997).

*Notosacantha badia* (Boheman)

**New host record:** SOUTH AFRICA, 23 km NW Harding, Ngele Forest, 30°31'31"S, 29°40'23"E, 2-X-1998, 22 adults. Beetles were feeding on leaves of *Maytenus mossambicensis* (Klotzsch), Celastraceae, growing at the forest edge. All beetles were collected from a single tree, however, inspections of another 12 trees of the same species growing nearby were uninhabited by this beetle. Feeding patterns on leaves consisted of elongate scrapings (*sensu* Heron and Borowiec 1997) approximately 1 mm wide and 4 mm in length, although five distinct feeding scars did connect to form one contiguous scar 14 mm long on a leaf. Feeding scars by *N. badia* did not develop into holes or notch the leaf margin.

*Notosacantha junodi* (Spaeth)

**New host record:** ZIMBABWE, Honde Valley, Aberfoyle Tea Estate, 18°17'32"S, 32°57'54"E, 17-VIII-1998, 32 adults. All beetles were taken from leaves of *Tarenna pavettoides* (Harv.), Rubiaceae. Beetles were feeding on both sides of the leaves. They were more common on heavily shaded, understory trees as opposed to trees growing in partial sunlight at the forest edge. Feeding scars comprised two patterns. Initial feeding consisted of slightly sinuous, elongate scars 2 × 10 mm that rarely perforated the leaf. Extensive feeding, possibly by several beetles, developed into irregular shaped, and sometimes large holes 10 × 33 mm, eaten through the leaf. Feeding was not observed along the leaf margin. Jolivet and Hawkeswood (1995) state that several tortoise beetles, such as *Notosacantha (Hoplionota)*, although recorded on Rubiaceae, are not really feeders on this family. However, Heron and Borowiec (1997) record *Notosacantha laticollis* (Boheman) on Rubiaceae, specifically *Canthium inerme* (L.f.). Their documentation, in addition to the large number of *N. junodi* adults found on *T. pavettoides*, confirms that Rubiaceae is not an accidental host for *Notosacantha* but a viable plant for adult subsistence.

*Notosacantha nervosa* (Spaeth)

**New host and country records:** ZIMBABWE, 40 km N Mhangura, Chipiri estate lake, 16°37'31"S, 30°06'42"E, 19-IX-1998, one adult. This species was feeding on the newly-forming, succulent leaves of *Brachystegia spiciformis* Harms, Fabaceae. A cursory inspection revealed that all the woody vegetation in the vicinity was either void of leaves or they possessed aged and weathered leaves. Borowiec (1999) recorded *N. nervosa* from "südlichsten Teil des Kongostaates: Elisabethville, Nieuwdorp, Kapiri" which is in Democratic Republic of the Congo (formerly Zaire).

*Notosacantha vogeli* (Weise)

**New host and country records:** ZIMBABWE, 40 km N Mhangura, Chipiri estate lake, 16°37'31"S, 30°06'42"E, 19-IX-1998, one adult. This beetle, like *N. nervosa*, was feeding on the newly-forming, succulent leaves of *Brachystegia spiciformis* Harms, Fabaceae. Borowiec (1999) recorded this species from Tanzania, Zaire, and Zambia.

The significance of these recorded plants suggests that several adult tortoise beetle species in southern Africa are sustaining themselves during the dry season (fall and winter) although leaf nutritional conditions may deteriorate during this- time. Jolivet and Hawkeswood (1995) note that some plants, such as the Fabaceae, are neutral hosts and serve a transitional role as a food source for leaf beetles during the dry season although these plants may not be true larval hosts. No tortoise beetle larvae were collected during the same time as when the adults were collected.

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### SCIENTIFIC NOTE

#### Notes on Two Afrotropical Water Beetles (Coleoptera: Haliplidae, Dytiscidae)

The object of this note is to provide new information on the distribution and ecology of two Hydradephaga species recently collected in Africa. Unless otherwise stated, all material is deposited in the author's collection.

*Pelodytes nodieri* Guignot

**Examined material.** Republic of Guinea: “Parc National du Haut Niger”, Faranah, Sidakoro, base-camp, 10°14'27"N, 10°27'41"W, 10.I.1996, M. Mei leg., 2 ♀ ♀; same site, 6–29.VI.1996, M. Mei leg., 1 ♀ (Museo di Zoologia dell'Università “La Sapienza”, Rome, Italy); “Parc National du Haut Niger”, Faranah, Niger river, Somorya, 10°28'48"N, 10°26'42"W, 30.I.1996, M. Fofana leg., 1 ♂.

**First record for Republic of Guinea.** This Haliplid beetle has only previously been reported from Mali (Guignot 1936), Benin (Guignot 1959) and Ivory Coast (Bilardo and Pederzani 1978). Moreover the records of *Pelodytes* sp. larvae from Ghana (Blay and Dongdem 1995) probably concern this species.

The ecology of this species is not well known and little information is available (cf. Guignot 1959; Bilardo and Pederzani 1978), thus the new records are also interesting for the precision of the collecting data. The first two females were netted from a residual pool of the Diakoly brook together with many Dytiscidae (cf. Rocchi 2000), the other was collected at light in the base-camp that is surrounded by the Diakoly brook and by a strongly disturbed xerophilic forest (wooded savanna?); the male specimen was collected at light between the Niger river's rocky bank and the adjacent forest reserve (cf. Mei and Fofana 1997).

*Yolina elegantula* (Boheman)

**Examined material.** Tanzania: Selou Game Reserve, Beho Beho, Maji Moto Hot Springs, 2.III.1997, C. Esposito leg., 1 ♂, 1 ♀.

**First record for Tanzania.** This species has been found in Malawi, Mozambique, Zimbabwe, South Africa (Biström 1983) and Zambia (Biström 1987; Pederzani 1988).

The Tanzanian biotope is situated “in a ravine surrounded by lush vegetation [miombo woodland]. Hot sulphurous water flows from the rocks, pours down the mountain in small streams until they finally join together in a series of picturesque pools” (Baldus 1996). The specimens were collected in running warm water, 30–40 cm deep, a little below one of the pools. The species seemed common, but without a net it was not possible to collect other specimens (C. Esposito, pers. comm.). The biology of *Yolina* Guignot is little known (cf. Biström 1983); in any case this is the first record from thermal water (O. Biström, *in litt.*). With this one, the number of *Yolina* species known from Tanzania (Biström 1983, 1988) becomes three.

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