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SOME FLEA BEETLES AND THEIR FOODPLANTS FROM KENYA (CHRYSOMELIDAE: ALTICINAE)

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ABSTRACT

During a brief visit to Kenya, the author collected 28 species, in 15 genera, of flea beetles (Alticinae), including new foodplant records for 17 species. No foodplants are known for any species in four of these genera. Almost one-half (13) of these species were previously unknown from Kenya.

In herbivorous insect systematics, all too often taxa are first described, included in regional faunal surveys, or monographed without regard for their foodplants. This is especially true in the tropical regions. Usually this is not the fault of the taxonomist or monographer, who often has not seen the creatures alive, but rather the collectors, whether specialists or not, who rarely make an effort to discover the foodplant hosts or to identify such hosts if they should notice them. Therefore, for many major herbivorous insect families (e.g., Chrysomelidae), where oligophagy or monophagy is quite common, virtually nothing is known about foodplant preferences or patterns in the tropics. Foodplants of a few species are known because they contain species harmful to agricultural products. In many genera of the Alticinae it would be valuable at least to know the foodplant family for a single species of a particular beetle genus, because the beetle genus may feed only on a single plant family (e.g., *Epitrix*) or several related families (e.g., *Phyllotreta*) (Furth 1979). For such cosmopolitan genera, knowledge of the foodplant from better-known regions will, thus, assist investigators to discover foodplant hosts for the tropical species in those genera. However, in many herbivorous groups the highest diversity of genera is in the tropics; e.g., Alticinae have approximately the following generic diversity: 220 (Neotropical); 100 (Oriental-Australian); and 65 (Ethiopian) (Scherer 1982).

Foodplant information is of value for biosystematic studies of the herbivores and possibly, for indicating chemical relationships among groups of plants. In addition, foodplant data are useful for finding potential biological control agents for introduced undesirable plants, i.e., noxious weeds. Unfortunately, much of the foodplant data that exist are essentially unavailable to researchers interested in ecological, biological, or biological control problems. This is because host information is often hidden in the literature in such a way as to be very difficult to retrieve, i.e., in various systematic works (especially monographs) or geographical surveys of an herbivore taxon with no accompanying foodplant index or key words. The author is especially aware of this from his attempts at surveying the arthropod herbivores of several plant groups on a worldwide basis (Balick *et al.* 1978; Furth 1985). Possibly the only way to overcome this problem would be to encourage systematists who study herbivorous arthropod groups to periodically publish foodplant surveys of their research taxa.

Methods and Results

The survey in the present paper is the result of a 42 day visit to Kenya, spent mainly at the International Center of Insect Physiology and Ecology (ICIPE) from early May until mid-June 1980. This period is normally in the midst of the primary rainy season. However, 1980 proved to be a drought year and relatively little rain fell; consequently, all areas of Kenya were drier than normal. Many insect groups were collected, and the non-chrysomelids were deposited in the entomological collections of the Tel Aviv University, Department of Zoology; all chrysomelids are in the author's private collection. The following areas of Kenya were visited and collections made as time permitted: 1) Nairobi (8–10 May); 2) southcentral, around Kajiado (10 May); 3) Rift Valley, Nakuru (11 May); 4) southwest, Nyanza district (12–13 May); 5) Rift Valley, Masai Mara (13 May); 6) southeast, Shimba Hills National Reserve (16–17, 19 May); 7) southeast, Mombasa North (18 May); 8) southeast, Mombasa South (20 May); 9) south, Kibwezi (23 May); 10) central, Mt. Kenya region (26–29 May); 11) southeast, Malinidi (31 May–1 June); 12) southeast, Shimba Hills National Reserve (2 June); 13) south, Amboseli area (7–8 May); 14) Nairobi, Langata Forest (9 June); 15) Nairobi, Athi River (10 June).

When alticine species were found to be feeding on a certain plant, samples of the foodplant were collected and eventually taken to the National Museum in Nairobi for identification by botanists at the herbarium. The author also made several visits to the entomological collection at the Nairobi National Museum in order to make preliminary identifications of some of the alticine specimens collected.

Table 1 lists all the species of Alticinae collected by the author while in Kenya, including the locality and foodplant/family if discovered. The known geographical distribution is also given for each species. To my knowledge there is no published foodplant information for any of these species (except as indicated in the footnotes of the Table).

Discussion

All of the foodplant records for the Alticinae listed here are new. Several of these are the first foodplant record for any member of the genus. A few host records are, in fact, in foodplant families that would be expected based on known foodplants from other regions. The two species of *Blepharida* were expected to be found on species of *Rhus* based on previous studies (Furth 1982). The records of the four species of *Chaetocnema* feeding on *Cyperus* and grasses is also no surprise, because in other regions some species are known to feed on grasses and sedges (Mohr 1966) and *Cyperus* (Furth, unpublished data).

The African genus *Gabonia* has over 130 described species and is presently in a state of taxonomic confusion and in need of revisionary study (G. Scherer, pers. comm.). During the field work for this paper (1980), the author met Dr. Michael Boppré at his field station (Shimba Hills National Reserve), where he studied the attraction and feeding of various adult Lepidoptera to plants containing pyrrolizidine alkaloids (PAs), presumably for defense and/or as precursors for male pheromones (Boppré 1981; Boppré and Scherer 1981; Boppré 1983). At that time Dr. Boppré had discovered a new species, *Gabonia gabriela* Scherer, whose males (only) were attracted in large numbers to the PA baits (see Boppré and Scherer 1981). Then, and on two subsequent occasions (localities 6 and 12), the author attempted to find females and the foodplant of *G. gabriela* but without success. In fact, even though four species of *Gabonia*

Table 1. List of flea beetles, general distribution, and foodplants from Kenya.

Species	Locality	Distribution	Foodplant
Amphimela sp.	12	—	—
Blepharida conradsi Weise	14	Kenya, Tanzania	*Rhus natalensis* (Anacardiaceae)
Blepharida marginalis Wse.	14, 16	Kenya, Tanzania, Uganda, E. Zaire, Sudan, Ethiopia	*Rhus natalensis, R. vulgaris*
Chaetocnema conducta suturalis Bryant	16	Kenya, Tanzania, Ethiopia, E. Zaire	*Cyperus* sp. (Gramineae)
Chaetocnema ljuba Bechyne*	6	Sudan, Somalia	*Cyperus* sp.
Chaetocnema nigripennis Lab.*	12	Zaire, Tanzania, Rwanda	*Cyperus* sp.
Chaetocnema wollastoni Baly*	13	S. Africa, Zaire, Chad, Sudan	grasses
Decaria aethiopica Chapuis	3, 5	Kenya, Tanzania, Ethiopia, Sudan, Zaire, Rwanda	general sweeping (annuals)
Decaria nigripennis Weise*	6	Tanzania	general sweeping
Gabonia sp. 1	4	—	—
Gabonia sp. 2	7	—	forest edge tree
Gabonia sp. 3	10	—	sweep forest edge
Gabonia sp. 4	6	—	forest edge tree
Hemipyxis nigripes Weise	6, 7	Kenya, Ethiopia, Sudan, E. Zaire, Rwanda	forest edge tree
Hespera fulvicollis Weise*	14	E. Zaire, W. Aden, N. Rhodesia	*Rhus natalensis*
Longitarsus gossypii Bryant**	1 (lite), 15	Sudan	*Heliotropium steudneri* Vatke (Boraginaceae), *H.* sp. near *cinerescens*
Longitarsus usambaricus Wse.*	4	Tanzania	Labiatae
Longitarsus zodiacus Bechyne*	1 (lite), 12	Sudan, Zaire, Guinea, Nigeria	—
Longitarsus sp. 1	6, 4	—	?*Asystasia laticapsula* (Acanthaceae) (site #6)
Longitarsus sp. 2	6, 12	—	?*Asystasia laticapsula*
Orthocrepis kibonotensis (Wse.)*	4, 6, 7, 11	Tanzania	*Tragia* sp. (Euphorbiaceae)
Phyllotreta ruficeps Weise*	11	Tanzania	*Maerua triphylla* var. *pubescens, M. triphylla calophylla* (Capparaceae)
Philopona usambarica Csiki*	8, 12	Tanzania, S. Rhodesia	*Thunbergia alata* (Acanthaceae)
Physodactyla rubiginosa Gerst.	8, 12	Kenya, Tanzania, S. Africa	*Thunbergia alata*
Physonychis wissmanni Weise*	8, 12	Tanzania	—
Podagrica kibonotensis Wesie*	10, 14	Tanzania	*Pavonia patens* (Malvaceae)
Podagrica weisei (Jacoby)*	10	Tanzania, Mozambique, S. Africa	*Pavonia patens*
Sphaeroderma sp.	6	—	general sweeping

* = new record for Kenya.
** = recorded from Kenya on *Heliotropium pectinatum* Vaupel (Boppré 1983).

were collected during this study, no definitive foodplants were established for this genus. However, individuals of *Gabonia* sp. 2 and 4 were collected at two localities (7 and 6, respectively) from the same forest edge tree species (a tree species with clusters of small green fruits). Boppré (1984) states that many more species of *Gabonia* are also attracted to sources of PAs. Another flea beetle, *Hemipyxis nigripes,* was also collected from this tree species at the same two localities (6, 7); however, this cannot be considered the foodplant of any beetle species until further investigations are made.

Based on foodplant information from other regions, species of *Longitarsus* would be expected to feed on Labiatae and Boraginaceae (Furth 1980). In fact, *L. usambaricus* and *L. gossypii* were found on these plant families. In the case of *L. gossypii,* this species was found subsequent to the present field work but recently published as feeding on *Heliotropium pectinatum* Vaupel at Shimba Hills National Reserve in Kenya (Boppré 1983). It is also interesting to note that two species, *L. gossypii* and *L. zodiacus,* are attracted to incandescent light. Two unidentified species of *Longitarsus* were thought to be feeding on *Asystasia laticapsula* (Acanthaceae). This would be the first record of any species of *Longitarsus* feeding on a member of the Acanthaceae, a family usually placed near/between Scrophulariaceae and Verbenaceae, which are known *Longitarsus* foodplant families.

The genus *Orthocrepis* is closely related (sometimes considered a subgenus) to *Hermaeophaga,* which contains some species known to feed on Euphorbiaceae (Mohr 1966; Furth, unpublished). The foodplant of *O. kibonotensis* is the euphorb *Tragia,* which is a nuisance nettle in many regions of the world, and this beetle may be a potential agent for biological control of this plant in some other regions.

It is known that some species of *Phyllotreta* feed on Capparaceae, which contain secondary/defense chemicals (thioglucosides) similar to those of the beetles' two other major foodplant families, Cruciferae and Resedaceae (Furth 1979). *Phyllotreta ruficeps* feeds on two subspecies/varieties of *Maerua,* which is the first record of a capparaceous-feeding *Phyllotreta* in Africa and the first species known to feed on *Maerua.*

Two species of two different genera, *Philopona usambarica* and *Physodactyla rubiginosa,* were found feeding on *Thunbergia alata* (Acanthaceae). This plant is commonly called the black-eyed susan and is used ornamentally in different parts of the world; these are new foodplant records for *Philopona* and *Physodactyla.*

It is well-known from the European fauna that species of *Podagrica* feed on plants in the Malvaceae (Mohr 1966). This foodplant pattern becomes more firmly established as indicated by the fact that *P. kibonotensis* and *P. weisei* feed on the malvaceous *Pavonia patens* in Africa.

Apparently all of the 28 species of Alticinae found during this study in Kenya are endemic to the Ethiopian (tropical African) region. About half of the records from this field work proved to be new distributional records for Kenya and all foodplant records are new. The results from this relatively brief visit and limited collecting illustrate that there is a wealth of foodplant and distributional information yet to be elucidated in tropical Africa. This study demonstrates that a thorough survey (stressing foodplant associations and identification) of Alticinae of Kenya over a broader seasonal and geographical range would certainly produce valuable data about many species and genera. Expanding this to other chrysomelids and, in fact, herbivorous insects in general, would revolutionize our knowledge of insect/plant co-evolution in the tropics and produce a model for similar research in other tropical regions.

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