# An Annotated Catalog and Summary of Bionomics of Blister Beetles of the Genus *Psalydolytta* (Coleoptera: Meloidae)

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## Abstract

Information on the taxonomy, anatomy, and bionomics of the species of *Psalydolytta* Péringuey is presented and summarized. *Psalydolytta testaceoapicalis* Pic, described from Guinea, is placed in the synonymy of *P. cineracea* (Mäklin) (**new synonymy**). The genus has a disjunct Ethiopian-Indian distribution (42 species in Africa, 10 in India). Adults appear toward the end of the rainy season, are generally nocturnal, and feed largely on flowers and developing grains of wild and cultivated grasses. Adults attracted to lights are sometimes a nuisance because of their ability to produce blisters on human skin. The larva of the Indian *P. rouxi* (Castelnau) has been recorded as a predator of the eggs of the pyrgomorphid grasshopper *Colemania sphenarioides* Bolívar and that of the African *P. fusca* (Olivier) as a predator of the eggs of the acridid grasshopper *Cataloipus fusco-coeruleipes* (Sjöstedt).

## Introduction

Adult blister beetles of the genus *Psalydolytta* have proved to be persistent and often serious pests of millets and other grain crops in both Africa and India. Several agricultural research projects currently in progress in West Africa involve the genus, and it is likely that others will be undertaken in this and other areas in the future. Fortunately, Kaszab's (1954) revision of the genus and Saha's (1979) review of the Indian species provide for relatively easy and reliable identification of adult material. Published information on the bionomics of the genus, however, is so widely scattered as to be largely inaccessible to field station workers. Further, citations of localities in the literature are often so cryptic that specialized gazetteers and a great deal of patience are required simply to determine the recorded range of a species.

In his revision of *Psalydolytta*, Kaszab (1954) cataloged the species known at the time but cited few references other than original taxonomic descriptions. In any event, the catalog is now quite outdated. In the catalog section of the present paper I cite for each species the original description and, insofar as possible, all subsequent references containing new information. Content is indicated for most references, with particular attention to bionomics. A few references are included simply because they involve new nomenclatural combinations. The editorial conventions adopted are much the same as those specified in a parallel paper on *Cyaneolytta* Péringuey (Selander 1986). The species groups and the order in which they appear are due to Kaszab (1954); species within groups and junior synonyms within species are arranged alphabetically. Nominal species proposed since Kaszab's (1954) revision are accepted as valid except for *P. testaceoapicalis* Pic, which is treated as a junior synonym of *P. cineracea* (Mäklin). Pic distinguished his species from *P. cineracea* solely on the basis of the color of the elytral pubescence, despite the fact that Kaszab (1954) had shown this character to be variable within *P. cineracea*.

*Psalydolytta* has been universally allied with *Epicauta* Dejean in the subtribe Epicautina (or tribe Epicau-

tini) on the basis of adult anatomy. This assignment is supported by the association of the larvae of *Psalydolytta rouxi* and *P. fusca* with egg masses of Acridoidea (Fletcher 1914; Selander and Laurense 1987) and by anatomical characteristics of the triungulin larva of *P. fusca* (Selander and Laurense 1987).

## Catalog

Family: **Meloidae**
Subfamily: **Meloinae**
Tribe: **Lyttini**
Subtribe: **Epicautina**
Genus: ***Psalydolytta* Péringuey**

Lacordaire 1859:676, footnote {Taxon recognized as unnamed genus for *Lytta fuscicornis* Klug and several undescribed species of the West Coast of Africa}. Péringuey 1909:254 {New genus for *Lytta lorigera* Gerstaecker, *Cantharis flavicornis* Mäklin, *Cantharis [le]prieuri* Mäklin, and *Cantharis pilipes* Mäklin}. Borchmann 1917: 102 {Catalog}. Kaszab 1952b:80 {In key to genera of Epicautina}; 1954:69 {Revision, species groups, key to species, catalog}. Anand 1977:36 {Key to Indian species}. Saha 1979:33 {Review of Indian species, with key}.

**Type-species:** *Lytta lorigera* Gerstaecker. Fixed by subsequent designation (Anand 1977:36).

### Aegyptiaca Group (Figure 1)

**aegyptiaca** Mäklin 1875:612 (*Cantharis*) {[Sudan] (Sennaar, [Central Region])}. Pic 1914b:103 (*Epicauta*) {Diagnosis, sexual dimorphism; Sudan (Famakah, Northern Region (Blue Nile))}. Kaszab 1954: 72, 83, 100 {Adds Cameroon; Egypt; Nigeria ([between] Uba and Bama, Borno, Oct.; Niger-Benue steamship trip; S Lake Chad, Oct.); Sudan (Tonga, Upper Nile); Uganda (Kitwanga, 3500 ft, Bunyoro District, May)}. Lewis 1958:39 {Adults appear to cause little or no blistering in humans in Sudan}. Ajayi 1980:6 {Adults occasionally feed in large numbers on pollen of *Pennisetum glaucum* [as *typhoides*] in Nigeria}. Bologna 1978:142 {Ethiopia (Gambela, 526 m, Ilubabor, Nov.)}.

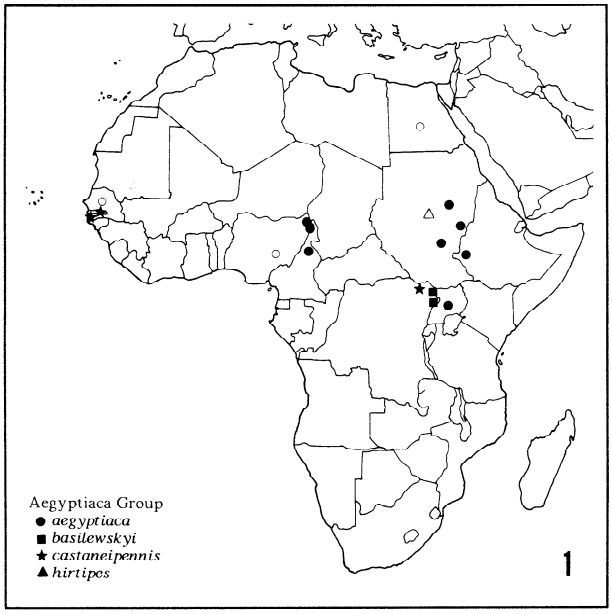


**Figure 1.** Geographic distribution of *Psalydolytta* (part).

*abnormalis* Kaszab 1954:72, 83, 100 {Ab. of *aegyptiaca*}. Medler 1980:237 {Nigeria; as *aegyptiaca abnormalis*}.

*albomarginata* Pic 1951:219 {Var. of *monardi*; Cameroon (Rei-Bouba, Sep.)}. Kaszab 1954:72, 100 {Ab. of *aegyptiaca*}.

*monardi* Pic, 1951:219 {Cameroon (Rei-Bouba, Sep.)}. Kaszab 1954:72, 100 {Ab. of *aegyptiaca*}.

**basilewskyi** Kaszab 1954:73, 84, 100 {Zaire (Ishwa, Lake Albert, [Haut-Zaire], Sep. [holotype]; Mahagi-Port, Haut- Zaire, Nov.)}.

**castaneipennis** Mäklin 1875:611 (*Cantharis*) {West Africa [as Guinea]}. Béguin 1874:20 (*Cantharis*) {Chloroform extract of adults produced blister in human in 6 hours; as *Castaneipenni* (Lac. Deyr.), a manuscript name}. Borchmann 1917:102. Kaszab 1954: 73, 100 {Senegal}; 1961:28 {Zaire (Localities in Garamba National Park, Haut-Zaire, savanna, at light and at base of clumps of grass, Sep., Oct. (2), Nov.)}; 1981b:118 {Gambia (Kabafita Forest Park, at light, Nov.; Sankuli-Kunda, 3.5 km S Georgetown, at light, Nov.); Senegal (Mpak, at light, Nov.)}.

**hirtipes** Kaszab 1954:73, 83, 100 {Ethiopia (Eli i Marocko [? = Marroco (Mareko Bota), Shoa], Jul.-Sep.)}.

### Fusca Group (Figure 2)

**fusca** Olivier 1795, no. 46, p. 8 (*Cantharis*) {Senegal}; 1808, no. 46, pl. 2, fig. 10 (*Cantharis*) {Figures adult}. Borchmann 1917:102. Kaszab 1954:74, 101 {Adds Gabon}; 1981b:118 {Gambia (Abuko, at light, Nov.); Senegal (Mpak, at light, Nov.; 2.2 km ESE Ziguinchor, at light, Nov.)}. Giglioli 1965: 659, fig. 1c {Adults attracted to light cause dermatitis in Gambia, Oct., Nov.; photograph of adult}. Pardo Alcaide 1969:238 {Senegal (Badi Camp, Parc National du Niokolo Koba, at light, Nov.)}. Gahukar 1984a:32 {Minor pest of *Sorghum bicolor* in Senegal}; 1984b:144 {Adults feed

on pollen of *Pennisetum glaucum* [as *americanum*] in West Africa, reducing grain filling}. Selander and Laurense 1987:490 *et seg*, figs. 1-3, 4b. {Pest of *Pennisetum glaucum* (as *americanum*) in Senegal, Gambia, and Guiné-Bissao; adults attracted to light at night; deposition and incubation of eggs in captivity; description of triungulin larva; triungulin larvae (and first grub larvae considered as probably representing *P. fusca*) found in egg pods of acridoid *Cataloipus fuscocoeruleipes* (Sjöstedt) in Gambia; larvae reared in laboratory from triungulin phase to coarcate phase on eggs of this grasshopper}.

*flavicornis* Mäklin 1875:614 (*Cantharis*). {Senegal}. Haag-Rutenberg 1880:19, footnote (*Lytta*) {Female antenna glabrous}. Fairmaire 1891: cclxxx (*Epicauta*) {West Africa; as *flavicornis* Lac., in error}. Pic 1914a:63 (*Epicauta*) {Uganda (Bululo and Bussu, Busoga)}. Roubaud 1915:591 (*Cantharis* (*Epicauta*)) {Adults known to blister human skin in Senegal}. Borchmann 1917:102. Risbec 1950:92 {Adults devour immature grains of *Pennisetum* in Senegal}. Appert 1957:89 {Adults eat stamens of millets in Mali [as Soudan] and Senegal, aborting seeds}.

**fuscicornis** Klug 1835:42 (*Lytta*) {Africa}.Haag-Rutenberg 1880:18, footnote {Synonymous with *flavicornis*; intimates that thin antennae of the "Type," which are glued on, do not belong with the specimen}. Borchmann 1917:102. Kaszab 1954:75, 89, 101 {Cameroon; Ethiopia (Eritrea); Ghana or Togo [as Togoland]; Senegal; Sudan; senior syn. of *inlineata* and *lineata*}; 1981a:167 {Ghana (Nakpanduri, Northern Region, Aug.)}; 1981b:118 {Gambia (Sankuli-Kunda, 3.5 km S Georgetown, at light, Nov.)}. Gahukar 1978:188 {Occasional pest of earheads of *Sorghum bicolor* and millets in West Africa}.

*inlineata* Pic 1947:1 {Var. of *flavicornis*; Mali [as Soudan]}.

*lineata* Pic 1951:219 {Var. of *flavicornis*; Cameroon (Rei-Bouba, Sep.)}.

**gridelli** Kaszab 1954:74, 88, 100 {Ethiopia (Tessenei, Eritrea) [holotype]; Sudan (Wad Medani, Central Province; Nuba Mountains, Aug.-Sep., and Taloldi, Nuba Mountains, Jun.-Aug., both in Kordofan; Nubian Desert); mentions Senegal on p. 101, apparently in error}.

**lorigera** Gerstaecker 1854:695 (*Lytta*) {Mozambique}; 1862:295, pl. 17, fig. 10 (*Lytta*) {Mozambique (Tete, Tete); technically an absolute junior homonymic synonym of *Lytta lorigera* Gerstaecker 1854}. Péringuey 1909:254 {Description; Mozambique (Beira, Sofala; Manica Province); Zimbabwe (Mutare [as Umtali])}. Pic 1932b:9 {Mozambique (Nova Chupanga, Sofala, Feb., Apr.; Tambara, Manica, Apr.)}. Kaszab 1954:74, 86, 101 {Botswana (Ngamiland), Nov.-Jan.; Mozambique (Pemba, Delgado); Namibia; Tanzania (Lindi, Lindi, Feb.-Apr.; Pueji [not found]); Zaire (Lubumbashi, Shaba, at light, Nov.-Jun.); Zimbabwe (Bindura, Jan.; Bulawayo, Dec.; Matetsi, Jan.)}; 1960b:271 {Tanzania (Handeni, 350 m, Tanga, Apr.; Morogoro, 550 m, Morogoro, May)}; 1975: 732 {Tanzania (Campus Fac. Agric., 600 m, Morogoro, Morogoro, at light, May- Jun.)}. Ferreira 1963:350. Bologna 1978:143 {Zimbabwe (Kadoma [as Gatooma] and vicinity)}. De Moor 1978:92 {Diagnosis; Botswana (Chobe National Park (Savuti Channel), Mar., Kasane [as Kasana], and Parakarungu, S Chobe River, Apr., all in Chobe; Tsau, Dobe River, Feb., 13 km N Maun, and Sepopa, W Okavango River, Mar., all in Ngamiland)}.

*ameliana* Kaszab 1954:73, 86, 101 {Ab. of *lorigera*}. Ferreira 1963:351.

*montana* Kaszab 1954:74, 87, 101 {Ssp. of *lorigera*; Zaire (Lusinga [holotype] and other localities in Upemba National Park, 1140-1810 m, Shaba, Jan.-Feb. (2), Mar. (8), Apr. (2))}; 1957:9 {Repeats description}.

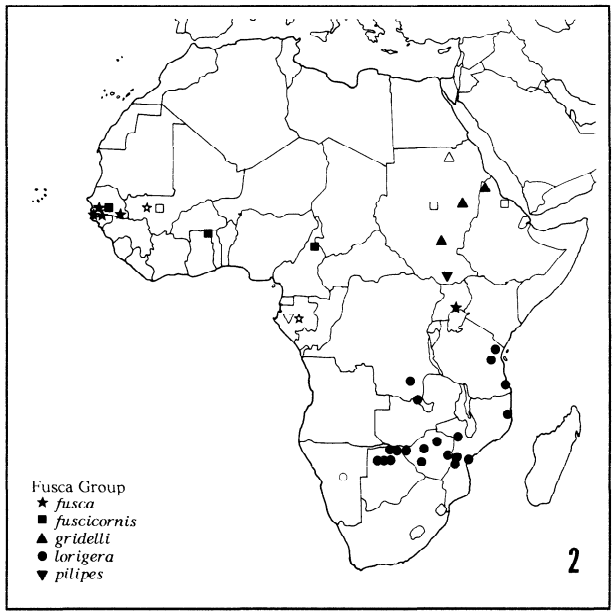


**Figure 2.** Geographic distribution of *Psalydolytta* (part).

*mozambica* Kaszab 1954:73, 86, 101 {Ab. of *lorigera*}. Ferreira 1963:351.

*unicoloripennis* Kaszab 1954:73, 87, 101 {Ab. of *lorigera montana*}; 1957:10 {Repeats description}.

**pilipes** Mäklin 1875:613 (*Cantharis*) {Senegal}. Gredler 1877:519 (*Cantharis* (*Epicauta*)) {Sudan (Gondokoro, Southern Region)}. Haag-Rutenberg 1880:19, footnote (*Lytta*) {Female legs glabrous}. Borchmann 1917:103. Risbec 1950:93 {Adults swarmed on earheads of *Pennisetum* at various localities in Senegal in 1945, destroying stamens in great quantity}. Kaszab 1954:74, 101 {Adds Gabon}; 1963:335 {Senior syn. of *remaudierei*}. Appert 1957:89 {Adults eat stamens of millets in Mali [as Soudan] and Senegal, aborting seeds}. Gahukar 1978:188 {Occasional pest of earheads of *Sorghum bicolor* and millets in West Africa}.

*?hirtifera* Castelnau 1840:274 (*Lytta hirtifer* [*sic*]) {Senegal}. Borchmann 1917:102 {Emendation}. Kaszab 1954:101 {Possibly synonymous with *pilipes*}.

*remaudierei* Pic 1953:1533 {Mali [as Soudan fr.] (Dogo (Macina [depression]), at light, Oct.)}. Kaszab 1954:103.

*senegalensis* Kaszab 1954:74, 86, 100 {Var. of *pilipes*; Senegal (Dagana)}.

## Vestita Group (Figs. 3, 4)

**antennata** Saha 1979:34, figs. 39-42. {India (Anand, Kuliyana [not found], and Visavadar, all in Gujarat, Sep., Oct.; Kaithal Road, Baros, Karnal District, Haryana, Sep. [holotype]; Tamil Nadu; Allahabad and Varanasi, both in Uttar Pradesh, Jul., Aug.); figures antennae, male genitalia; not placed in species group but said to be near *atricollis* and *meridionalis*}.

**atricollis** Pic 1920:18 (*Epicauta*) {India [as Indes]}. Kaszab 1952a:574; 1954:77, 89, 101 {India (Simla, Himachal Pradesh; Kanara [former district], Karnataka; Bombay [city or former state], Maharashtra; Darjeeling, West Bengal; Pachmeira [not found])}; 1959, fig. 16 {Hindwing}. Anand 1977: 36, 28 (*Psaldolytta* [*sic*]) {In key; India (adds Bihar; Gujarat; Himalaya [region]; Madhya Pradesh; Uttar Pradesh)}; 1980:18, figs. 9, 36, 69, 94 (*Psaldolytta* [*sic*]) {Male abdominal sternum VIII [as tergum IX], genitalia}. Saha 1979:36 {India (Kithar, Bihar, Sep.; Surendranagar and Visavadar, both in Gujarat, Sep. (2); near Bhupdal [not found], at light, and Gokak, at light, both in Karnataka, Nov. (2); Jabalpur, 456 m, Madhya Pradesh, Sep.; Dhond, at light, and Panchgani, 1200 m, both in Maharashtra, Oct.; Shahzadpur, Allahabad District, Uttar Pradesh, Jul.)}.

**diversipes** Pic 1920:18 (*Epicauta*) {[India] (Assam)}. Kaszab 1952a:574; 1954:77, 101. Anand 1977:36, 39 (*Psaldolytta* [*sic*]) {In key}. Saha 1979:42.

**laticornis** Kaszab 1954:77, 90, 101 {Senegal}.

**meridionalis** Kaszab 1960a:154 {India (Coimbatore, Tamil Nadu, Oct. [holotype]; Chipurupalle, Vishakhapatnam District, Andhra Pradesh)}.

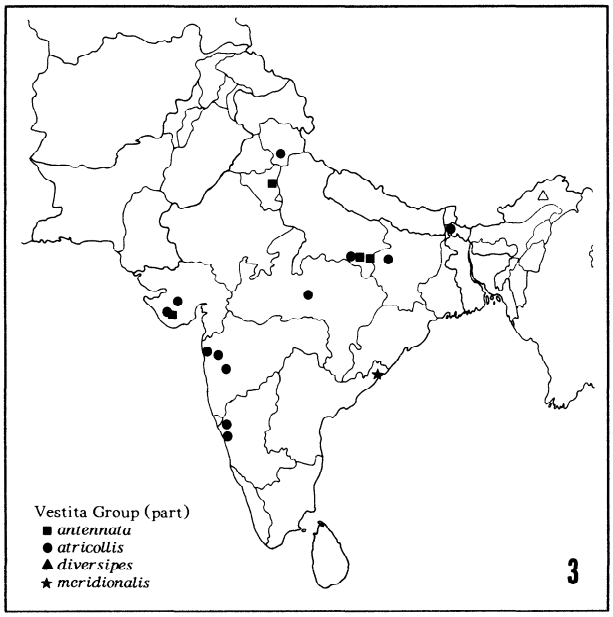


**Figure 3.** Geographic distribution of *Psalydolytta* (part).

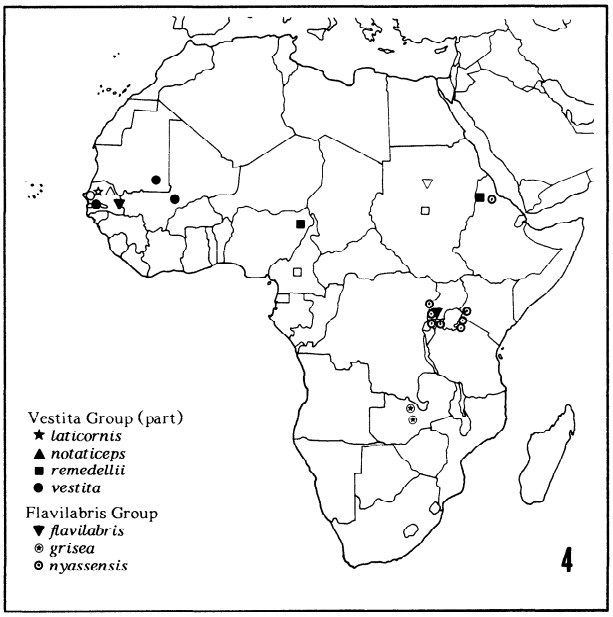


**Figure 4.** Geographic distribution of *Psalydolytta* (part).

Anand 1977:36, 39 (*Psaldolytta* [*sic*]) {In key}. Saha 1979:43.

**notaticeps** Pic 1947:2 {Senegal}. Kaszab 1954:76, 101 {Near *vestita* but perhaps identical to *remedellii kamerunensis*}.

**remedellii** Borchmann 1942:690 {Ethiopia (Tessenei, Eritrea, Sep.)}. Kaszab 1954:76, 101 {Adds Cameroon; Sudan}.

*kamerunensis* Kaszab 1954:76, 91, 101 {Ssp. of *remedellii*; Nigeria (Dure, [Borno], Aug. [formerly in Cameroon])}.

**vestita** Dufour 1821:359, pl. 130, fig. 3 (*Cantharis*) {Senegal [Hab. in Senegalliae floribus]; figures adult; as *vestila* in text, *vestita* in plate legend}. Klug 1835:42 (*Lytta*). Roubaud 1915:591 (*Cantharis*) {Adults known to blister human skin in Senegal}. Borchmann 1917:103. Pic 1934:91 {Mauritania (Néma)}. Risbec 1950:92 (*Cantharis*) {Adults devour immature grains of *Pennisetum* in Senegal}. Kaszab 1954:77, 101 {Senior syn. of *basipennis*}; 1981b:119 {Gambia (Tendeba Camp, near Gambia River, at light, Nov.; Sankuli-Kunda, 3.5 km S Georgetown, at light, Nov.)}. Gahukar 1984b:144 {Adults feed on pollen of *Pennisetum glaucum* [as *americanum*] in West Africa, reducing grain filling}. Selander and Laurense 1987:480 {Pest of *Pennisetum glaucum* (as *americanum*) in Mauritania and Mali}.

*basipennis* Pic 1947:2 {Var. of *vestita*; Senegal}; Pic 1953:1534 {Var. of *vestita*; adults assembling and mating on inflorescences of the grass *Cymbopogon giganteum* near Dogo, Macina [depression], Mali, Sep.}.

### Jaloffa Group (Figure 5)

**jaloffa** Castelnau 1840:275 (*Lytta*) {Senegal}. Pic 1914a: 63 (*Epicauta*) {Uganda (Bululo, Busoga; Kakindu [as Kakindo], Buganda)}. Borchmann 1917:102. Pic 1929:118 {Zaire (Bambili to Niangara, Haut-Zaire, Nov.)}. Kaszab 1954:71, 75, 80, 102 {Adds Ethiopia; senior syn. of *luteipes*; as *Yaloffa* on p. 75}; 1981a:167 {Ghana (Damongo, Northern Region, Aug.)}. Lewis 1958:39 {Adults blister humans in Sudan}. Pardo Alcaide 1969:238 {Senegal (Wassadou, Aug.)}.

*longissima* Pic 1947:1 {Var. of *jaloffa*; Upper Niger River [as Haut-Niger]}. Kaszab 1954:75, 102.

*luteipes* Borchmann 1925:7 {Sudan (Nil[e River], Aug.}.

**kittenbergeri** Kaszab 1954:75, 93, 101 {Kenya (Kwa Kitoto [not found] and Kadem to Kwa Muiya [not found], Nyanza, Mar.-Apr.; Mirua Valley, 4500 ft, Nyanza (Southern Kavirondo), May); Tanzania (Shirati, [Mara], May [holotype])}.

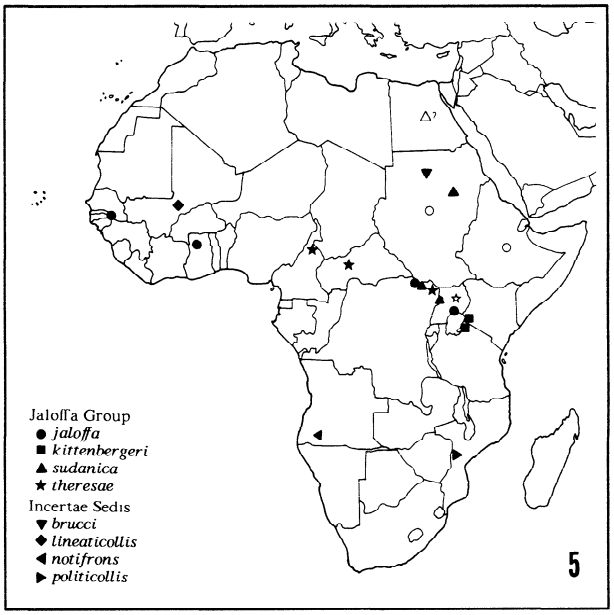


**Figure 5.** Geographic distribution of *Psalydolytta* (part).

**sudanica** Kaszab 1954:76, 91, 101 {Egypt or Egyptian Sudan [holotype]; Sudan (Omdurman, Khartoum); Zaire (Ishwa, [near] Lake Albert, and Doruma, Uele River, both in Haut- Zaire, Sep.); mentions Uganda on pp. 76 and 100, apparently in error}.

*flavithorax* Kaszab 1954:76, 92, 101 {Ab. of *sudanica*}.

*obscurithorax* Kaszab 1954:76, 92, 101 {Ab. of *sudanica*}.

*rufa* Kaszab 1954:76, 92, 101 {Ab. of *sudanica*}.

*unicoloricollis* Kaszab 1954:76, 92, 101 {Ab. of *sudanica*}.

**theresae** Pic 1947:1 {Central African Republic (Kaga Bandoro) [as Fort-Crampel]}; 1951:219 {Cameroon (Rei-Bouba, Sep.)}. Kaszab 1954:76, 101 {Adds Uganda; Upper Niger River [as Haute Niger]}; 1961:29 {Zaire (Localities in Garamba National Park, Haut-Zaire, savanna, on "les herbes d'un Ndiwili," Sep. (2), Oct. (2))}. Medler 1980:237 {Nigeria, in error; as *theresae theresae*}.

*notatithorax* Pic 1947:1 {Var. of *theresae*; [Central African Republic (Niam-Niam [tribal area, north of Ubangi River])}. Kaszab 1954:76, 101 {Ab. of *theresae*}.

*obliterata* Pic 1947:1 {Var. of *theresae*; Central African Republic (Kaga Bandoro) [as Fort-Crampel]}. Kaszab 1954:76, 101 {Ab. of *theresae*}; 1961:29.

Medler 1980:237 {Nigeria, in error; as *theresae obliterata*}.

### Rouxi Group (Figure 6)

**fasciculata** Pic 1920:18 (*Epicauta*) {India [as Indes]}. Kaszab 1952a:574; 1954:78, 102 {Near *villipes*}. Anand 1977:36, 39 (*Psaldolytta* [*sic*]) {In key}. Saha 1979:42.

**menoni** Anand 1977:37, 38, figs. 1-7 (*Psaldolytta* [*sic*]) {India (Dhulia farm, Bombay, Maharashtra), on soybean [*Glycine max*] leaves, Oct.; assigned to Rouxi Group but compared only with *atricollis*, in Vestita Group; figures antennae, abdominal sterna VIII [as IX], and genitalia}; 1978:472, fig. 13 (*Psaldolytta* [*sic*]) {Photograph of adult; as *menoai* in fig. legend}; 1980:18, figs. 4, 37, 74, 99 (*Psaldolytta* [*sic*]) {Male abdominal sternum VIII [as tergum IX], genitalia}.

**rouxi** Castelnau 1840:274 (*Lytta rouxii*) {India (Bombay [city or former state], [Maharashtra])}. Fairmaire 1894:18 (*Cantharis*) {India (Konbir [not found], Chota Nagpore, Bihar or Madhya Pradesh); as *Rouxii*}; 1896:8 (*Cantharis*) {India (Tamil Nadu); as *Rouxii*}. Maxwell-Lefroy 1906:205-206, figs. 244-245 (*Cantharis*) {Adults damage *Sorghum*, rice [*Oryza sativa*], *Panicum sumatrense* [as *miliare*], and *Pennisetum glaucum* [as *typhodeum*] in India by destroying the flowers; figures adult}; 1907:136, fig. 20 (*Cantharis*) {India (Bihar; Kanara [former district], Karnataka); adults feed at night on anthers and pistils of rice [*Oryza sativa*] and small millets; figures adult}. Maxwell-Lefroy and Howlett 1909:346 (*Cantharis*) {Adults destructive to *juar* [*Sorghum bicolor*], rice [*Oryza sativa*], and millets}. Coleman 1911a:1168 (*Cantharis*) {Adults flying to lights and blistering humans in Harihar, Karnataka, India, Oct.}. Fletcher 1914:302, fig. 147 (*Gnathospastoides* [*sic*]) {India (adds Krishna [as Kistna] District, Andhra Pradesh; Bellary and Kurnul, both in Karnataka; Coimbatore, Tamil Nadu); adults do considerable damage to earheads of *Pennisetum glaucum* [as *typhoideum*], *Setaria italica*, and *Sorghum bicolor* [as *Andropogon sorghum*], eating the pollen so that no new grain is formed; deposition and incubation of eggs; larval predator of eggs of Deccan grasshopper [*Colemania sphenarioides* Bolivar]; pupa found in the field with egg masses of this acridoid; figures adult}; 1917:51, 201 (*Gnathospastoides* [*sic*]) {Adults on leaves of *Phaseolus mungo radiatus* at Pusa, Bihar, India, but scarcely a pest; also eating pollen and young, developing grains of *Setaria italica*}; 1921:177 (*Gnathospastoides* [*sic*]) {Adults attacking earheads of *Panicum sumatrense* [as *miliare*] at Seoni, Madhya Pradesh, Sep., and eating nearly 2/3 of crop at Bhandara, Maharashtra, by selecting seeds that were just ripening; attacking earheads of *juar* [*Sorghum bicolor*] at Hubli-Dharwar, Karnataka, Sep.; on *cholam* [*S. bicolor*] at Davanakonda, Aug.; additional Indian localities: Samalkot and Vijayawada [as Bezwada], both in Andhra Pradesh; Surat, Gujarat; Yemmiganur, Bellary District, Karnataka; Hoshangabad, Madhya Pradesh; Faizabad, Uttar Pradesh}. Borchmann 1917:103. Ballard 1921:25 (*Gnathospastoides* [*sic*]) {Farmers in Bellary District, India, claim that beetles rolled in a mixture of assafoetida and cow-dung and then liberated drive other beetles from fields}. Kaszab 1954:79, 102. Purohit and Pawar 1959:40 (*Gnathopastoides* [*sic*]) {List of food plants, none new}. Usman and Puttarudraiah 1955:103 {India (Bangalore, Davangere, and Kolar, all in Karnataka, Oct.); adults on *jowar* [*Sorghum bicolor*], maize [*Zea mays*], and *ragi* [*Eleucine coracana*]}. Anand 1977:36, 39 (*Psaldolytta* [*sic*]) {In key}; 1978:472, fig. 14 (*Psaldolytta* [*sic*]) {List of food plants, none new; photograph of adult; *royxi* in text}; 1980:18, figs. 7, 38, 68, 95 (*Psaldolytta* [*sic*]) {Male abdominal sternum VIII [as tergum IX], genitalia}. Saha 1979:37 {India (Madjupur, Bihar, Jul.; Sasan Gir, at light, and Visavadar, at light, both in Gujarat, Sep. (2); Jabalpur, 488 m, Sep., Madhya Pradesh)}. Gahukar and Jotwani

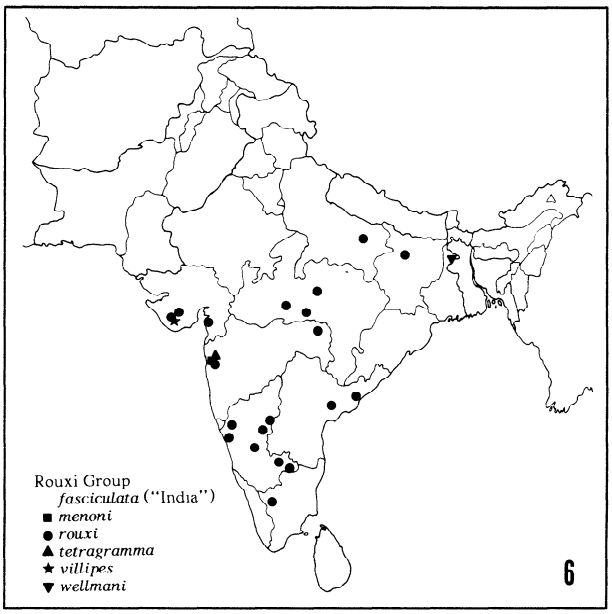


**Figure 6.** Geographic distribution of *Psalydolytta* (part).

1980:145 (*Gnathospatoides* [*sic*]) {Long considered as a key pest of *Pennisetum glaucum* [as *typhoides*] in India, feeding on flowers and developing grains}. Dua and Kacker 1984:21, fig. 1, tbl. 1 {Diagram of chromosomes; diploid number 20; identified as "sp. near *rouxi*"}.

**tetragramma** Haag-Rutenberg 1880:82, 84 (*Lytta*) {India (Bombay [city or former state], [Maharashtra])}. Borchmann 1917:84 (*Epicauta*). Kaszab 1954:78, 102. Anand 1977:37, 39 (*Psaldolytta* [*sic*]) {India (adds Assam)}. Saha 1979:39.

**villipes** Haag-Rutenberg 1880:87 (*Lytta*) {India (Bombay [city or former state], [Maharashtra]), according to Kraatz 1880:16}. Borchmann 1917:85 (*Epicauta*). Kaszab 1954:78, 102. Anand 1977:37, 39 (*Psaldolytta* [*sic*]) {In key; India (adds Gujarat)}. Saha 1979:40 {India (Sasan Gir, at light, Gujarat, Sep.)}.

**wellmani** Kaszab 1960a:156 {India (Malda District, West Bengal [as Bengal, Maldah])}. Anand 1977:37, 39 (*Psaldolytta* [*sic*]) {In key}. Saha 1979:41.

## Sheffieldi Group (Figure 7)

**bicoloriceps** Pic 1931:95 {Zaire (Lubumbashi, Shaba), Jan. [as Elisabethville, Congo Belge]}. Kaszab 1954:78, 102 {Zaire (adds Lulua River, Kasai Occidental or Shaba)}.

**kindana** Kaszab 1954:79, 93, 102 {Zaire (Kiambi, Kinda [holotype], Kafakumba, Kapanga, Luashi [as Lusahi], Muteba, and Sandoa, Lulua River, all in Shaba, Jan, Mar. (3), Mar.-Apr.; "Lomami, Mutombo, Muluku" [? = Mutombo-Mukulu in Shaba, but it is on the Lubilash, not the Lomami, River]; Rio Tshende-Mushyi [not found], Lulua River, Kasai Occidental or Shaba, Feb.)}.

**sheffieldi** Pic 1909:97 (*Lytta* (*Epicauta*)) {Zaire (Shaba) [as Congo Belge, Katanga]; possibly a var. of *substrigata*}. Borchmann 1917:103. Kaszab 1954:79, 102 {Zaire (Mukebe-Kasiri, Shaba)}; 1957:10 {Zaire (Localities in Upemba National Park, 1050-1700 m, Shaba, Feb. (2), Mar.)}.

*katangana* Kaszab 1954:79, 93, 102 {Ab. of *sheffieldi*}.

## Leprieuri Group (Figure 7)

**delkeskampi** Kaszab 1954:79, 95, 102 {Senegal; Togo (Bismarckburg [ruins at 8°11'N, 0°41'W], Sep.-Oct. [holotype]); Region de Sassa [not found]}; 1961:29 {Zaire (Localities in Garamba National Park, Haut-Zaire, in savanna, on and under grasses, Oct. (4), Dec.)}.

*flava* Kaszab 1961:30 {Ab. of *delkeskampi*}.

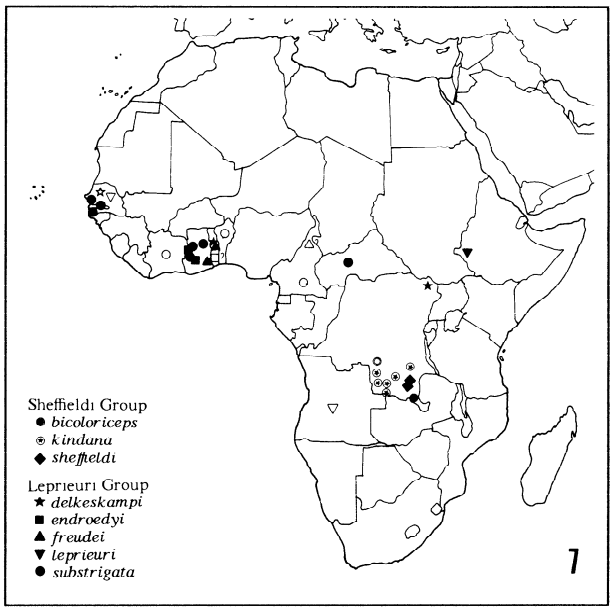


**Figure 7.** Geographic distribution of *Psalydolytta* (part).

*garambana* Kaszab 1961:30 {Ab. of *delkeskampi*}.

**endroedyi** Kaszab 1981a:171, figs. 15-17 {Ghana (Banda Nkwanta, Sep., Oct., Nov.; Bui Camp, Brong-Ahafo Region, Oct., Nov.); Ghana or Togo [as Togoland] [holotype]; not assigned to species group but said to be near *substrigata*}.

**freudei** Kaszab 1954:79, 94, 102 {Cameroon? (Uham [not found], Upper Sangha River region [as Bezirk Obersanga Uham, Kamerun]); Ghana (Ho) [as Station Ho, Togo]; Togo (Bismarckburg [ruins at 8°11'N, 0°41'W], Apr.-Jun., Sep., Sep.-Oct. (3), Oct.); Ghana or Togo [as Togoland] [holotype]}.

**leprieuri** Mäklin 1875:616 (*Cantharis*) {Senegal}. Borchmann 1917:102. Kaszab 1954:79, 102 {Adds Angola}. Ferreira 1965:807. Bologna 1978:143 {Ethiopia (Gambela, Ilubabor, Dec.)}.

**substrigata** Castelnau 1840:274 (*Lytta*) {Senegal}. Borchmann 1917:103. Kaszab 1954:80, 102 {Adds Cameroon; Ivory Coast; Nigeria (Niger-Benue River steamship trip)}; 1981a:167 {Ghana (Banda Nkwanta, Damongo, and Tamale, all in Northern Region, Sep., Oct. (2), Nov. (2), Dec.; Bui camp, Brong-Ahafo Region, Nov.)}; 1981b:119 {Gambia (Tendeba Camp, at light, Nov.; Kabafita Forest Park, 2.2 km NNW Brikame W Road Junction, Nov.); Senegal (Mpak, at light, Nov.; Ziguinchor, Nov.)}. Giglioli 1965:659, figs. 1b, 2 {Adults attracted to light cause dermatitis in Gambia, Oct., Nov.; sudden reduction or increase in air pressure, electric shock (3 v), and

handling did not cause bleeding; photographs of adult}. Gahukar 1984a:32 {Minor pest of *Sorghum bicolor* in Senegal, the adults feeding on pollen}.

*crampeli* Pic 1932a:32 {Central African Republic (Kaga Bandoro) [as Fort Crampel, Congo]}; Villiers 1953:1330 {Adults on *Andropogon gayanus* at M'Bao, Senegal, Oct.}.

*limbatipennis* Kaszab 1954:80, 95, 102 {Ab. of *substrigata*}; 1981a:167.

*luteolineata* Pic 1947:2 {Var. of *crampeli*; Benin [as Dahomey]; Senegal}. Kaszab 1954:79, 102 {Ab. of *substrigata*}; 1981a:167; 1981b:119.

### Atripes Group (Figure 8)

**atripes** Borchmann 1942:689 {Tanzania [as Deutsch-Ostafrika] (Lukuledi, [Mtwara])}. Kaszab 1954: 81, 102. Ferreira 1963:350 {Mozambique (Alto Ligonha, Nampula)}.

**bequaerti** Pic 1913:163 (*Lytta* (*Epicauta*)) {Zaire [as Congo Belge] (Kasenga, [Shaba])}. Borchmann 1917:102. Kaszab 1954:81, 102 {Adds Zambia}.

*obscuricolor* Pic 1947:1 {Var. of *fusca*; "Congo"}. Kaszab 1954:81, 102 {Ab. of *bequaerti*}.

**brittoni** Kaszab 1954:81, 97, 102 {Malawi (between Mangoche and Chikala Boma, 4000 ft, Mar.; Blantyre, Mar.)}. Gomes Alves 1961:224 {Diagnosis; Mozambique (Mutuáli [as Mutali], Nampula, Oct.)}. Ferreira 1963:350.

**pici** Kaszab 1954:82, 96, 102 {Cameroon (Yoko [as Joko]); Ivory Coast (Dimbroko); Uganda (Gulu [as Fulu]); Zaire (Bambesa; Dungu, Uele River; Luma (Dajalasiga); Moto [as Yobo Moto], Upper Uele River, all in Haut-Zaire, Nov. (2))}; 1961:30 {Zaire (Localities in Garamba National Park, Haut-Zaire, savanna, at light and on grasses, Sep., Oct., Oct.-Nov., Nov. (3))}.

### Flavilabris Group (Figure 4)

**flavilabris** Mäklin 1875:619 (*Cantharis*) {[Senegal] (Galam) [as E Galam Africae][1]}. Pic 1914a:63 (*Epicauta*) {Uganda (Kabulamuliro)}. Borchmann 1917: 102; 1925:7 {Sudan (Nile River, Aug.)}. Kaszab 1954:82, 102 {Specifies only Senegal}.

**grisea** Kaszab 1954:83, 97, 102 {Zambia (Mwengwa, 13°S, 27°40'E, Jan., Feb.; Kahitu, N Broken Hill, Jan.)}.

**nyassensis** Kaszab 1954:83, 98, 102 {Ethiopia (Gundet, Eritrea); Kenya (Ilala, 14 mi E Mumias, 4500 ft, Western Province, Jun.; Migori Valley, 4200 ft, Mirua Valley, 4500 ft, and Upper Kuja Valley, 4200 ft, all in Nyanza (Southern Kavirondo District), May (3); Rwanda (Gabinga [not found], Kagera [region], Apr.; Lac Mohasi [not found], Apr.; Tanzania (Bukoba and "Marienburg bei Bukoba," Kagera; Mara Bay, Musoma, Ruwana Steppe, and Shirati [holotype], all in Mara, Apr. (3), May); Tanzania or Rwanda, Mar.; Uganda (Kamuwezi, Dec.; Ussoga [not found], May-Jul.); Zaire (Ituri River region); "East Africa" ("Kwesi bis Kilo"; Niavangi, Apr.)}.

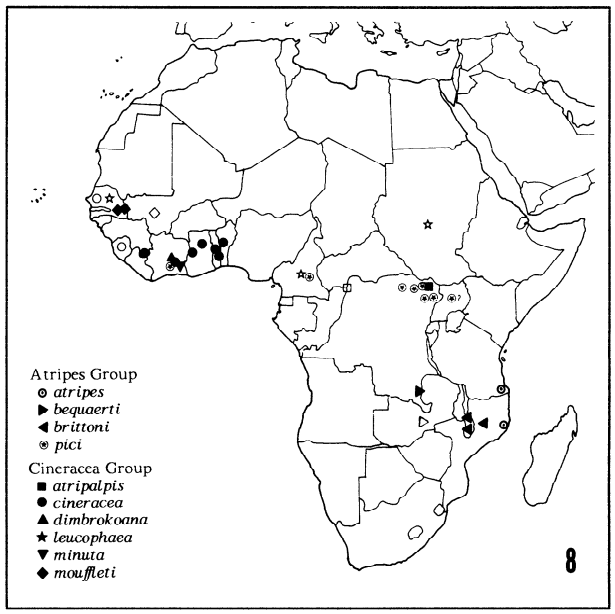


**Figure 8.** Geographic distribution of *Psalydolytta* (part).

### Cineracea Group (Figure 8)

**atripalpis** Pic 1947:2 {Central African Republic, Congo, or Zaire (Ubangi River) [as Oubangui]}. Kaszab 1954:81, 103 {Cites type locality as in Zaire}; 1961:31 {Zaire (Localities in Garamba National Park, Haut-Zaire, primarily in savanna, associated with grasses and herbs, Aug. (3), Sep. (7), Oct. (3))}.

**cineracea** Mäklin 1875:618 (*Cantharis*) {Senegal}. Pic 1952:102 {Benin (Bassila), Jun.-Jul.}. Kaszab 1954: 80, 82, 103 {"Gold Coast" [? = Ghana]; Ivory Coast (Dimbroko); Senegal; Sierra Leone; Togo (Bismarckburg [ruins at 8°11'N, 0°41'W], Aug.; between Klein Popo [not found] and Bismarckburg, Aug.; Misahöhe, Jul.)}; 1981a:168 {Ghana (Banda Nkwanta and Tamale, both in Northern Region, Aug., Sep., Oct.)}.

*flavopubens* Kaszab 1954:80, 82, 100, 103 {Ab. of *cineracea*}.

*testaceoapicalis* Pic 1958:202 {Guinea (Kéoulenta [and] Yalanzou)}. *New synonymy.*

**dimbrokoana** Kaszab 1954:82, 99, 103 {Ivory Coast (Dimbroko)}.

**leucophaea** Mäklin 1875:617 (*Cantharis*) {Senegal}. Borchmann 1917:102. Kaszab 1954:81, 82, 103 {Adds Cameroon; "Gold Coast" [? = Ghana]; Sudan}.

**minuta** Pic 1932a:31 {Ivory Coast}. Kaszab 1954:80, 103 {Ivory Coast (Dimbroko); perhaps only a var. of *cineracea*}.

**mouffleti** Mäklin 1875:615 (*Cantharis*) {Senegal (Galam)}. Kaszab 1954:82, 103; 1963:335 {As *moufleti*}. Pardo Alcaide 1969:239 {Senegal (Badi Camp, Parc National du Niokolo Koba, at light, Nov.)}.

*uniformis* Pic 1947:1 {Mali [as Soudan]}. Kaszab 1954: 74, 100 {Interprets type locality as Sudan}; 1963: 335 {Ab. of *mouffleti*}.

### Incertae Sedis (Figure 5)

**brucci** Castelnau 1840:273 (*Lytta*) {[Sudan] (Dongola [Northern Region])}. Borchmann 1917:102. Kaszab 1954:103.

**lineaticollis** Pic 1953:1532, fig. 1 {Mali [as Soudan fr.] (Mopti, at light, Dec.); figures adult}. Kaszab 1954:103.

**notifrons** Marseul 1879:59 (*Cantharis*) {Angola (Humbe, [Cunene])}. Wellman 1909:618 (*Lytta*). Borchmann 1917:102. Kaszab 1954:103. Ferreira 1965: 807.

**politicollis** Fairmaire 1893:31 (*Epicauta*) {[Mozambique] (Choa, [Manica])}. Borchmann 1917:80 (*Epicauta*). Kaszab 1953:483 {Belongs in *Cylindrothorax* Escherich}; 1955:227 {Probably a species of *Psalydolytta*}.

## Summary of Bionomics

**Geographic Distribution:** *Psalydolytta* has a disjunct Ethiopian-Indian distribution remarkably similar to that of *Cyaneolytta* (Selander 1986). In *Cyaneolytta* the ratio of Oriental to Ethiopian species is 5:25 and in *Psalydolytta* 10:42. These ratios are of the same order of magnitude as the ratio of the areas of the Indian subcontinent and Africa occupied by the two genera (roughly 1:6). Each genus is represented in the Oriental Region by two species groups. In *Cyaneolytta* both groups also occur in Africa; in *Psalydolytta* the Vestita Group has four species in India and four in Africa and the Rouxi Group, with six species, is endemic to India.

The major distributional differences between *Cyaneolytta* and *Psalydolytta* in the Ethiopian Region are as follows: First, *Psalydolytta* is confined to the African continent, without representation in the Cape Verde Islands, Madagascar, or [contrary to my previous statement (Selander 1986)] the Arabian Peninsula. As argued in the work cited, this difference may be attributed to the fact that *Psalydolytta* is not phoretic in the larval stage. Second, while *Psalydolytta* has three-fourths again as many species as *Cyaneolytta* on the African continent (42 versus 24), it maintains its superiority in number of species only in the equatorial region. In South Africa the ratio of species of *Psalydolytta* and *Cyaneolytta* declines to 8:11 south of 10°S and to 0:4 south of 20°S. A similar, albeit more subtle, relationship seems to exist in the Sahelian region at the northern limits of range, although the influence of sampling error on the observed distributional patterns is undoubtedly much greater there. Further, although *Psalydolytta* occurs as far north as *Cyaneolytta* in India, the ratio of species of the two genera increases from 1:9 south of 20°N to 5:7 north of that latitude. Thus, in a statistical sense at least, *Psalydolytta* is more nearly a tropical genus than is *Cyaneolytta*. Third, it seems significant that there are no records of *Psalydolytta* from the Somalian coast, where *Cyaneolytta* is represented by eight species.

**Seasonal Distribution of the Adult Stage:** Most records of adults are from August to November north of the equator, both in Africa and India, and from February to March south of the equator, in Africa (Table 1). In general, then, the period of adult activity begins toward the end of the rainy season and coincides with the primary period of fertilization and maturation of grass seeds, including those of many cultivated plants. As comparison of Table 1 of the present paper with Table 1 of Selander (1986) will demonstrate, seasonal ranges are generally more limited and discrete in *Psalydolytta* than in *Cyaneolytta*.

**Diel Distribution of Adult Activity:** Maxwell-Lefroy (1907) reported that adults of the Indian *P. rouxi* feed on rice and millets at night, and adults of *P. fusca* attacking *Pennisetum glaucum* in Gambia exhibit a marked pattern of nocturnal behavior (Selander and Laurense 1987). That nocturnal activity is generally characteristic of adults of the genus is suggested by the large proportion of records at light and perhaps also by the paucity of feeding records on plants other than crops. Thirteen species, representing seven of the 10 species groups of the genus, have been recorded at light on one or more occasions: *Psalydolytta castaneipennis, P. fusca, P. fuscicornis, P. lorigera, P. pilipes, P. atricollis, P. vestita, P. substrigata, P. pici, P. mouffleti,* and *P. lineaticollis* in Africa and *P. rouxi* and *P. villipes* in India.

| Species | N/S | Intervals J-F | M-A | M-J | J-A | S-O | N-D |
|---|---|---|---|---|---|---|---|
| AFRICA | | | | | | | |
| *aegyptiaca* | N | | | 1 | | 4 | 1 |
| *basilewskyi* | N | | | | | 1 | |
| *castaneipennis* | N | | | | | 3 | 4 |
| *hirtipes* | N | | | | ? | ? | |
| *fusca* | N | | | | | | 4 |
| *fuscicornis* | N | | | | 1 | 1 | 1 |
| *gridelli* | N | | | ? | ? | ? | |
| *pilipes* | N | | | | | 1 | |
| *remedellii* | N | | | | 1 | 1 | |
| *vestita* | N | | | | | 1 | 2 |
| *jaloffa* | N | | | | 3 | | 1 |
| *sudanica* | N | | | | | 1 | |
| *theresae* | N | | | | | 5 | |
| *delkeskampi* | N | | | | | 5 | 1 |
| *endroedyi* | N | | | | | 3 | 2 |
| *freudei* | N | | ? | ? | | 5 | |
| *leprieuri* | N | | | | | | 1 |
| *substrigata* | N | | | | | 5 | 9 |
| *pici* | N | | | | | 2 | 5 |
| *flavilabris* | N | | | | 1 | | |
| *atripalpis* | N | | | | 3 | 10 | |
| *cineracea* | N | | | | 4 | 2 | |
| *mouffleti* | N | | | | | | 1 |
| *lineaticollis* | N | | | | | | 1 |
| *lorigera* | S | 6 | 16 | 2 | | | |
| *kittenbergeri* | S | | 1 | 2 | | | |
| *bicoloriceps* | S | 1 | | | | | |
| *kindana* | S | 2 | 5 | | | | |
| *sheffieldi* | S | 2 | 1 | | | | |
| *brittoni* | S | | 2 | | | | |
| *grisea* | S | 3 | | | | | |
| *nyassensis* | S | | 7 | 5 | | | |
| INDIA | | | | | | | |
| *antennata* | N | | | | 2 | 3 | |
| *atricollis* | N | | | | 1 | 5 | 2 |
| *meridionalis* | N | | | | | 1 | |
| *menoni* | N | | | | | 1 | |
| *rouxi* | N | | | | 2 | 7 | |
| *villipes* | N | | | | | 1 | |

**Table 1.** Frequency distribution of records of adults of *Psalydolytta* in two-month intervals. N and S distinguish records north and south of the equator. Intervals are specified by initial letters of their constituent months.

**Food Plants:** With two, or possibly three, exceptions, all plant associations recorded for adult *Psalydolytta* involve species of Gramineae (Table 2). Included are both wild species (*Andropogon gayanus, Cymbopogon giganteum,* and unidentified grasses) as well as most of the important grain crops of tropical Africa and India. While

| Food Plants | *aegyptiaca* | *castaneipennis* | *fusca* | *fuscicornis* | *pilipes* | *vestita* | *theresae* | *menoni* | *rouxi* | *delkeskampi* | *substrigata* | *pici* | *atripalpis* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Species of *Psalydolytta* | | | | | | | | | | | | |
| **Gramineae** | | | | | | | | | | | | | |
| *Andropogon gayanus* | | | | | | | | | | | • | | |
| *Cymbopogon giganteum* | | | | | | • | | | | | | | |
| *Eleucine coracana* | | | | | | | | | • | | | | |
| *Oryza sativa* | | | | | | | | | • | | | | |
| *Panicum sumatrense* | | | | | | | | | • | | | | |
| *Pennisetum glaucum* | • | | • | | • | • | | | • | | | | |
| *Setaria italica* | | | | | | | | | • | | | | |
| *Sorghum bicolor* | | | • | | • | | | | • | | • | | |
| *Zea mays* | | | | | | | | | • | | | | |
| "millets" | | | | • | | | | | | | | | |
| "grass" | | • | | | | | | | | • | | • | • |
| **Leguminosae** | | | | | | | | | | | | | |
| *Glycine max* | | | | | | | | • | | | | | |
| *Phaseolus mungo* | | | | | | | | | • | | | | |
| **Other** | | | | | | | | | | | | | |
| "Ndiwili" | | | | | | | • | | | | | | |

**Table 2.** Food plants of species of *Psalydolytta.*

some reports refer to *Psalydolytta* species as sporadic, minor pests, it would appear that in West Africa, at least, several members of the genus are currently major pests of pearl millet (*Pennisetum glaucum*) and great millet (*Sorghum bicolor*). Damage to grain crops results from adults eating floral parts, including pollen, and developing grains on the earheads; no instances of leaf feeding on Gramineae have been reported.

Evidence of varietal differences in attractiveness of great millet to *Psalydolytta rouxi* was found by Fletcher (1921), who reported that sweet and dwarf Milo varieties but not the *Sundhia* variety were attacked at Hubli-Dharwar, Karnataka, India.

Although the mechanics of feeding by *Psalydolytta* beetles have not been studied, it seems likely that the enlarged, vaulted, non-overlapping mandibles, which constitute the primary diagnostic characteristic of the genus, are adapted for feeding on the inflorescences of wild grasses. Mandibles of similar conformation occur in several North American species of *Epicauta,* including *E. balli* Werner, which feeds on the pollen of the grass *Bouteloua curtipendula* (Werner, Enns, and Parker 1966: 34, fig. 39), and *E. mimetica* (Horn), for which Horn (1875) proposed the genus *Gnathospasta* (no longer recognized), primarily on the basis of mandibular structure.[2]

**Immature Stages:** Until recently, published information relating unequivocally to the immature stages of *Psalydolytta* consisted solely of a paragraph by Fletcher (1914:302) on the Indian species *P. rouxi*:

> Eggs were laid in captivity (in October 1911) in groups of 50 to 125 each. The young larvae hatched out after about fifteen days and were extremely active. In captivity the larva was found to feed freely on egg-masses of the Deccan grasshopper [*Colemania sphenarioides* Bolivar]. Further details of lifehistory [*sic*] [were] not worked out, but this beetle has been bred from a pupa found with these egg-masses.[3]

Fletcher's report, completely overlooked until recently, is of more than ordinary interest since it established for the first time an association between Meloidae and the acridoid family Pyrgomorphidae. Subsequently, *Epicauta gorhami* Marseul was reared in the laboratory on the eggs of a second species of the family, *Atractomorpha lata* (Motschulsky), in Japan (Nagatomi and Iwata, 1958; as *A. bedeli* Bolivar). Apart from these grasshoppers, all species of Acridoidea recorded as larval hosts in nature or used in successful laboratory rearings of Meloidae belong to the family Acrididae.

Data comparable to Fletcher's were reported for the African *Psalydolytta fusca* by Selander and Laurense (1987), who also presented a detailed description of the triungulin larva. These authors observed captive females laying eggs in soil; in addition, they obtained egg masses from females collected at lights and confined without food in glass vials. Twenty-seven eggs masses contained a mean of 125.2 eggs (range 36 to 225). Mean incubation time for 19 masses at 27°C was 22.3 days; within individual egg masses the hatching period extended over a period of 2-9 days (mean 5.1). In the field in Gambia two triungulins of *P. fusca* and several first grub larvae tentatively identified as representing that species were found in egg pods of the grasshopper *Cataloipus fuscocoeruleipes* (Sjöstedt), a member of the acridid subfamily Eyprepocnemidinae. Further, by releasing groups of triungulin larvae on moist sand containing *Cataloipus* egg pods, the authors reared two larvae to the coarctate phase of development.

**Medical Importance:** Circumstantial evidence that adult *Psalydolytta* contain cantharidin was first obtained by Béguin (1874), who produced blistering of human skin in 6 hours by application of a chloroform extract of adults of *P. castaneipennis*. Since then there have been scattered reports of accidental blistering of humans by adults of *P. fusca*, *P. vestita*, *P. jaloffa*, and *P. substrigata* in Gambia and/or Senegal and *P. rouxi* in India. As is generally true of Meloidae, most incidents of this nature involve beetles attracted to lights in public places.

An exceptionally detailed investigation of dermatitis caused by *Psalydolytta fusca*, *P. substrigata*, and *Cylindrothorax melanocephala* (Fabricius) in the Gambian village of Keneba over a period of five years was summarized, in part, by Giglioli (1965:663) as follows:

> The beetles were attracted to bright lights, and since they occurred at a time of the year when people stayed out of doors until late at night, the chances of accidental contact were greatly enhanced. The large light-stupified insects crawling over bare skin were promptly swatted and the haemolymph of the crushed beetle was smeared over the perspiring skin. This resulted in the appearance of large bullae where the beetle was crushed and vesicular areas of linear dermatitis or macular patches where the blistering fluid was smeared. The blisters appeared 12-24 hours after contact and were completely painless until broken, then they produced intense burning and itching. Blistering occurred most commonly on the face, neck, chest, and thighs and calves and often on the buttocks in young children who had sat on dead beetles during the day. Unlike the dermatitis produced by Staphylinid beetles, no cases of eye involvement were seen with Gambian Meloïd beetles. If left untreated, the lesions were prone to infection and ulceration, if disinfected and kept clean, they healed satisfactorily, but more slowly than similar sized blisters produced by burning.

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## Notes

[1] Lippincott's New Gazetteer of the World (1906) identifies Galam as a country or district of French Africa in Senegambia occupying a tract along the Falémé and Upper Senegal rivers, with Bakel as its chief settlement. This area forms the eastern limits of the Occidental Region of modern Senegal.

[2] *Gnathospastoides*, first used in combination with *rouxi* by Fletcher (1914), is apparently a manuscript name of Wellman alluding to the similarity of the mandibles of *Psalydolytta rouxi* and *Epicauta mimetica*.

[3] Early in this century *Colemania sphenarioides* was an important pest of *jola* (*Sorghum bicolor*) in southwest India, where it was studied intensively by Coleman (1911b). At three localities in Karnataka, Coleman found first grub larvae of an unidentified meloid, which may well have been *Psalydolytta rouxi*, eating *Colemania* eggs.