The scientific name of the coffee bean weevil and some additional bibliography (Coleoptera: Anthribidae: *Araecerus* Schönherr)

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Abstract. The name Araecerus fasciculatus (DeGeer 1775) is resurrected for the coffee bean weevil, with the following synonyms: Bruchus cacao Fabricius 1775, Bruchus peregrinus Herbst 1797, Bruchus capsinicola Fabricius 1798, Anthribus coffeae Fabricius 1801, Amblycerus japonicus Thunberg 1815 (probably a synonym), Anthribus alternans Germar 1824, Phloeobius griseus of Stephens 1831, not Fabricius 1792, Cratoparis parvirostris Thomson 1858, Araecerus seminarius Chevrolat 1871, and Tropideres (Rhaphitropis) mateui Cobos 1954. Lectotypes are designated for A. fasciculatus, B. capsinicola, and A. alternans. A diagnosis distinguishes Araecerus from all 650 anthribid genera and a diagnosis for the species is as complete as possible with materials studied. Some additional species of Araecerus are discussed: Bruchus crassicornis Fabricius 1798 is distinguished from A. fasciculatus and a lectotype is designated. Araecerus suturalis Boheman 1839 is diagnosed and shown to be dissimilar from the species recently reported as A. suturalis from South Africa. The identity of Araecerus suturalis of Frieser, not Boheman, is not yet clear. Araecerus sambucinus Boisduval 1835 and Trepideres [sic] fragilis Walker 1859 may be synonyms of A. fasciculatus but pertinent data are insufficient. Brachytarsus niveovariegatus Roelofs 1879 (spelled nigrovariegatus by Bovie (1906)), listed as a synonym of A. fasciculatus by Wolfrurn (1929) is removed to Anthribus Forster 1770 with Anthribus lajievorus Chao 1976 as a new synonym.

Introduction

The name of the coffee bean weevil, a worldwide pest of cocoa, coffee, and dozens of other dried plant materials, has recently been changed from Araecerus fasciculatus (DeGeer 1775) to Araecerus coffeae (Fabricius 1801) by Zimmerman (1994). Zimmerman points out that DeGeer's original description and illustration do not resemble the coffee bean weevil, and he concluded that the name Curculio fasciculatus DeGeer was based on some unknown beetle. He chose, from several available synonyms, Anthribus coffeae Fabricius 1801, as the replacement name. These actions are not acceptable for the following reasons: the DeGeer collection is preserved in the Naturhistoriska Riksmuseet in Stockholm, and was curated by C. J. Schönherr who marked the original DeGeer specimens with small red (now faded) pin labels. He also discarded some specimens and replaced others, but these did not receive the red labels. The collection now contains three specimens under the name fasciculatus, all with Schönherr's red pin labels; all are coffee bean weevils. I now designate as lectotype of *Curculio* fasciculatus DeGeer 1775, the male bearing a small round, British Museum lectotype label (placed by me in 1970, but not published). This action binds the

name fasciculatus to the coffee bean weevil, and restores the name used for this species in over five hundred publications worldwide for over 200 years. This also ignores the discrepancy between DeGeer's publication and collection, it assumes that Schönherr (the most outstanding weevil specialist of his time) knew what he was doing when he curated DeGeer's collection, it provides nomenclatorial stability for a worldwide pest, and it returns the name coffeae Fabricius to synonymy. The last point is important because even if fasciculatus is invalidated, the name *coffeae* is a junior synonym of several older names and should not be used. There has been so much confusion about the identity of C. fasciculatus and its synonyms, I have designated lectotypes for all pertinent names. This clarifies both the taxonomy and nomenclature of this economically important species. The history of this taxon is detailed below.

Araecerus Schönherr

See Valentine (1999: 252), for generic synonymy.

The following diagnosis will separate this genus from all 650 genera of World Anthribidae. Antennal insertion dorsal, next to the inner, apical margin of the round eyes which have a small notch at the end of the suprascrobal carina, latter not continued posteriad along the inner eye margin; antennomeres 5 - 7 symmetrical, not swollen on one side; three club articles small, very loosely articulated; head not retractile into prothorax, the eyes too wide; prothorax not constricted at base, transverse carina present, basal, lateral angle rectangular, lateral carina not reaching supracoxal suture; short, basilateral carinula present but not or weakly projecting as an isolated lobe below the humerae: ventrolateral corners of prosternum pubescent, not glabrous; scutellum small but visible, not vestigial; elytra with 10 plus scutellar striae; hind coxae elongate transverse; all tarsi longer than 1/2 a tibia; male pygidium almost vertical, apex broadly rounded, female pygidium oblique, apex with a blunt point; male metastenum with a weakly-developed median trichobothrium, absent in females; male fore tibiae and tarsi with sexual modifications involving length, curvature, rows of asperities, apical spurs, or areas of dense erect setae.

Araecerus has about 75 described species, all in that Indo-Pacific area circumscribed by India, Japan, Australia, and Hawaii. One species, Araecerus fasciculatus (DeGeer) is now a worldwide pest, and has been described as new by several authors. The species is diagnosed below, followed by the synonyms in chronological order, using the original name combinations. All the names, except Bruchus crassicornis Fabricius are, or appear to be, synonyms of Araecerus fasciculatus (DeGeer).

The species of *Araecerus* are variable and difficult to characterize. Araecerus fasciculatus (De-Geer) has the following features: dorsum without tubercles, tufts, crests, or costae; antennal club very slender, asymmetrical, each article tapering at both ends; prosternal antecoxal strip not linear, roughened with fine microsculpture and not coarsely punctured; pronotum finely reticulate-punctate; lateral carina not reaching supracoxal suture, frequently weakly upturned at apex; elytral pubescence tessellate dark and light brown and gray plus a small, paler postscutellar spot; legs with tibiae relatively long and slender, with four (sometimes very vague) dark annuli or spots often best developed on hind legs; males with fore tibiae not denticulate along ventral length, without an apical spur, and not bent or hooked; male fore tarsus with basal article elongate, narrow, setose ventrally, not bent or arched upward in center, about as long as articles 2-5 combined; male mesocoxa without a small tooth mesal to the attachment of the trochanter; male

internal sac with a group of about 5 small sclerites, the two largest triangular.

Much of the economic literature about this species is listed in the bibliography compiled by Childers and Woodruff (1980).

Curculio fasciculatus DeGeer

DeGeer, C. 1775: 276, species #10, pl. 16, fig. 2.

Type locality: "Surinam".

Discussion: Lectotype, here designated, a male in the DeGeer collection, with a round British Museum lectotype pin label; paralectotypes: male and female; all three with Schönherr's red (now pink) pin labels indicating original DeGeer specimens, these placed below a separate, not original, label "10. C. fasciculatus / p. 276".

Bruchus cacao Fabricius

Fabricius, J. C. 1775: 64.

Type locality: not given; "in Theobromae seminibus".

Discussion: Holotype female in the Fabrician "Kiel" collection labeled "cacao". Olivier (1795: 15), who worked closely with Fabricius, says about *cacao*: "Il se trouve á l'Amérique méridionale".

Note: I have not been able to determine the priority of the above works and have accepted synonymy proposed by Schönherr, 1833: 175. If the name *fasciculatus* is discarded, the oldest replacement name is *cacao*, not *coffeae*.

Bruchus peregrinus Herbst

Herbst, J.F.W. 1797: 168, pl. 106, fig. 9, F.

Type locality: "Amerika": my translation is: brought with seeds from America; in "Mus. Herbst".

Note: I have not seen type material, however, synonymy with *coffeae* Fabricius was proposed by Schönherr (1833: 175). The Schönherr collection has a female coffee bean weevil labeled "A. peregrinus / Hbst. e Cayana. / Chevrolat." This individual lacks a head and is grayer than most, but it has the other features of *fasciculatus*. The synonymy was accept-

ed by de la Porte (1840: 288), Sturm (1843: 181), Taschenberg (1869: 118), and subsequent authors.

Bruchus capsinicola Fabricius

Fabricius, J. C. 1798: 159.

Type locality: "in Cajennae seminibus".

Discussion: Lectotype, here designated, the more complete of two males in the Fabrician "Kiel" collection (lacks right elytron, left elytron adherent to pin; the paralectotype lacks head and prothorax) labeled "capsini / cola".

Note: In the same publication, Fabricius (1798: 159) described *Bruchus crassicornis* which is also a species of *Araecerus*, but is clearly distinct from *fasciculatus*. This species has been widely misidentified, so some brief comments are provided here:

Bruchus crassicornis Fabricius

Fabricius, J. C. 1798: 159.

Type locality: "in Indiae orientalis seminibus. D. Daldorff."

Discussion: Lectotype, here designated, one of three damaged females, the first in the series, with the elytra spread by the pin, in the Fabrician "Kiel" collection; paralectotypes: the other two females. This distinct species has shorter, non-annulate, red tibiae, antennal club segments short, fat, blackish, almost symmetrical; antecoxal strip of prosternum very short; pronotum with disc more inflated and with three weakly-defined longitudinal pale stripes, the dorsolateral pair much wider than the narrow median line.

Anthriubus coffeae Fabricius

Fabricius, J. C. 1801: 411.

Type locality: "In Indiae Coffea. D. Daldorff Mus. D. de Sehested".

Discussion: There are two males in the Sehested and Tonder Lund Collection, one without data, one labeled "Essequibo. / Smidt. / Mus. S. & T. L. / fascicula: / tus, DeG. / coffeae. Fabr." There is also a male in the Kiel collection labeled "coffeae". Since Fabricius described the species from India in the

Sehested collection, the Essequibo [British Guiana] specimen is excluded, and the Kiel collection specimen is probably excluded. I here recognize the male without data in the Sehested and Tonder Lund Collection as the holotype. The specimen is in good condition, lacking only the left antenna.

Amblycerus japonicus Thunberg

Thunberg, C.P. 1815: 122.

Type locality: "Habitat in Japonia". Holotype in the Zoological Museum, Uppsala University, Sweden (Wallin and Wallin 1989: 16), but I have not seen it.

Note: although synonymized with coffeae by Schönherr (1839: 273), the identity of this taxon is uncertain. It may be synonymous with Araecerus fasciculatus (DeGeer), or with A. tarsalis Sharp (1891: 323), also described from Japan. The two species share tibiae with dark spots or rings; however, according to Morimoto (1978: 26, 28-29) males of fasciculatus have the "fore tibiae simple or at most with a row of minute granules on the underside" while tarsalis males have "fore tibiae serrate or with tooth-like granules on the underside." Also, the internal sac of male fasciculatus has a pair of small triangular sclerites plus others which are absent in tarsalis.

Anthribus alternans Germar

Germar, E.F. 1824: 175.

Type locality: "Habitat in Brasilia."

Discussion: Germar's Anthribidae are in the Martin-Luther Universitat, Halle, Germany. They are included in the catalogue of weevils by Taschenberg (1869: 115-118), who lists: "A. coffeae F. = peregrinus Hbn. = alternas [sic] Germ. 7 Expl. Rio de Janeiro [sic]." A male and two females have green printed labels with "Rio d. / Pedr.", and four others on three pins have no labels. Many specimens of other species have very similar green labels with " Rio d. Jan." so I believe Taschenberg was careless when he cited Janeiro instead of Pedras. The seven individuals are adjacent to a hand-written green label: "Coffeae Fabr. / peregrinus Hbr. / alternans GM / Bras." They are coffee bean weevils. I here select as lectotype of Anthribus alternans German the male with the green "Rio d. Pedr." label, and I have placed a round British Museum lectotype label on the pin. The other six specimens are lectoparatypes.

Phloeobius griseus Stephens

Stephens, J.F. 1831: 211, pl. XXI, fig. 2. This is not *Phloeobius griseus* (Fabricius, 1792: 377), see discussion below.

Type locality: "I have taken a specimen in London; and others have occurred in Suffolk and in Devonshire".

Discussion: Stephens appears to have had coffee bean weevils that he misidentified as *Anthribus griseus* Fabricius (1792: 377), a species transferred to *Phloeobius* by Schönherr (1823: 1135). I agree with the synonymy first proposed by Schönherr (1839: 273).

Cratoparis? parvirostris Thomson

Thomson, J. 1858: 113.

Type locality: By inference and present designation: Gabon, West Africa, based on Thomson's publication of this species in his "Voyage au Gabon". Holotype unknown, see following discussion.

Discussion: A male coffee bean weevil labeled "Gabon" is in the R. Oberthur collection in the Museum Nationale d'Histoire Naturelle in Paris. It bears the above name and fits Thomson's short description. There is no indication it is a type, but this is the only individual I have seen with this name in the many collections examined.

Horn and Kahle (1936: 279) and von Hayek (1989: 83) reported that in 1865 James Thomson began to sell parts of his huge beetle collection of over 35,000 species. Some families went to René Oberthur, who in turn sent material to Neervoort van de Poll and Maurice Sedillot. The van de Poll collection was purchased by the Tring Museum in England and was amalgamated with Karl Jordan's anthribids and then combined with the British Museum (Natural History) to form the most important collection of Anthribidae in the World: 180 drawers, housed in London. The Sedillot Anthribidae (which include those from the Chevrolat collection) is in the Paris Museum. I have not recognized Thomson types in either collection. Horn and Kahle also state that Thomson's Voyage au Gabon

Coleoptera are in the "Mus. Roy. Hist. Nat. Belg., Brüssel". When I visited the Institut Royal des Sciences Naturelle de Belgique in Brussels in 1989, I saw no recognizable Thomson material, and was told that, at least for anthribids, Horn and Kahle were incorrect. On the other hand, the account of this museum in Arnett, Samuelson, and Nishida (1993: 24) mentions holdings from the collections of Thomson and Oberthur. Based on these items, it appears that some beetle groups from Thomson are in Brussels, but not the Anthribidae.

I consider this taxon a probable junior synonym of *Araecerus fasciculatus* (DeGeer) because, although the genus is not native to Africa, *A. fasciculatus* occurs continent-wide. I have seen dozens of specimens from Gabon, Cameroon, Zaire, Ghana, Togo, Nigeria, Angola, South Africa, and Somalia, and it has been reported from Kenya (Jordan 1914: 344), Tanzania (Kolbe 1897: 291), Rwanda (Jordan 1955: 347), and Malawi (Lee 1971: 2).

Identification of this species in Africa is complicated by the recent report (Frieser 1993:41) of a second species, Araecerus suturalis Boheman (1839: 273), type locality: Calcutta, India, which was reared from dry male cycad cones in South Africa. A male and female from this series, determined by Frieser, have been received in exchange from the National Collection of Insects, Pretoria, South Afica. They differ from A. fasciculatus as follows: tibiae dull reddish-brown, non-annulate; pronotum more convex; elytral pubescence without a post-scutellar pale spot; male fore tibiae with a ventral row of denticles; male fore tarsi weakly depressed, the basal article weakly arched and bent (more convex on dorsal and exterior surfaces) with a few long ventral setae. They differ from the male holotype of A. suturalis Boheman, in Stockholm, because the latter has broadly depressed, densely setose fore tarsi, and longitudinally striped elytra, interstriae 1-3 and 7-11 are dark, 4-6 are pale, interstriae 3, 7, 8, 9 with 2 to 6 pale spots each, interstriae 1, 2, 10, 11 uniformly dark; male fore tibiae unarmed. Males of all three species lack mid-coxal tubercles. The prosternal antecoxal area of A. fasciculatus and the South African specimens lack coarse punctures, this condition is unknown for A. suturalis. It is clear that two introduced species of Araecerus occur in South Africa: fasciculatus (DeGeer) and suturalis of Frieser, not Boheman.

Araecerus seminarius Chevrolat

Chevrolat, L.A.A. 1871: 7, pl. 1, fig. 5.

Type locality: Paris, France, apparently imported from Brasil.

Discussion: The female holotype in Paris is labeled: "__[illegible] / vivant a / Paris" written on a green label (green was a widely used code for the Neotropics). There is also a separate box label: "Araecerus / seminarius Chvt / Brasilia D. D. Huet" written on green paper. Chevrolat states "Acun renseignement bien précis ne m'a été fourni sur la mode de vie de cet insecte". The holotype is a normal coffee bean weevil.

Tropideres (Rhaphitropis) mateui Cobos

Cobos, A. 1954: 41, fig. 1.

Type locality: Spain: "Tiana (Prov. de Barcelona); J. Mateu, coll."

Discussion: Holotype female in the Instituto de Aclimatación, Almeria, Spain. Cobos states the unique type is a male, but his illustration clearly shows the pointed pygidium characteristic of females. Synonymy by Valentine (1999: 252).

It is difficult to understand why Cobos placed this taxon in the wrong subfamily, aligned with two genus-group names that are unrelated and fall into very different tribes. Although the type has not been examined, the description and figure convince me that this is a coffee bean weevil.

The ten synonyms discussed above do not complete the picture. Zimmerman (1994: 205,208) lists Araecerus sambucinus Boisduval 1835: 299, and Trepideres [sic] fragilis Walker 1859: 220, as synonyms of A. coffeae (Fabricius), for the former citing synonymy by Dejean (1837: 259), [actually 1836] and for the latter, synonymy by Pascoe (1859: 438) [actually p. 439]. I have not seen Boisduval's original description, and the location of his type, if it still exists, is unknown. The type of Walker's fragilis is a male from "Ceylon" in the British Museum, London. When I examined it, I did not know enough about the genus to form a strong opinion about its identity, except that it was clearly in the group of species that includes fasciculatus, lutatus (Fairmaire) (=vieillardi Montrouzier 1860, of older authors), and others. A male Ceylon topotype looks like fasciculatus with simple fore tibiae and nonpunctured antecoxal strip of the prosternum; but it has tuberculate mid coxae. The identity of *fragilis* Walker remains unsettled.

Wolfrum (1929: 107) lists another synonym: the species described as *Brachytarsus niveovariegatus* Roelofs 1879:1v, from Japan (spelled "*nigrovariegatus*" by Bovie (1906: 313)). The species is not in *Araecerus*, it belongs in *Anthribus* Forster 1770, occurring in Japan, China, and Korea. Chinese specimens were redescribed as a new species: *Anthribus lajievorus* Chao 1976: 339, new synonymy. I have seen a topotypic paratype, and specimens from all three countries.

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