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ENTOMOLOGICAL INVESTIGATIONS ON THE SPIKE DISEASE OF SANDAL (7).

THE GENUS *EXOCENTRUS*, CERAMBYCIDÆ (COL.).

BY

W. S. FISHER,

Bureau of Entomology, United States Department of Agriculture.

This paper gives the results of a study of several collections of beetles belonging to the genus *Exocentrus* Mulsant, Cerambycidae, sub-family Lamiinae, received from the Forest Research Institute, Dehra Dun, United Provinces, India, and collected in connection with the Institute's Sandal Insect Survey.

[The localities mentioned in this paper are :—

COORG : North Coorg Forest Division, within five miles of Fraserpet, elevation about 2,770 feet.

MADRAS : North Salem Forest Division, within four miles of Aiyur, elevation about 2,850 feet ; Jawalagiri, elevation about 3,050 feet.

For further details of the collecting stations of the Forest Research Institute Survey of the insect fauna of sandal, *Santalum album*, Linn., see Ind. For. Rec., Vol. XVII, Part IX. C. F. C. B.]

1. *Exocentrus flemingiae* Fisher.

Exocentrus flemingiae Fisher, Indian Forest Records, Ent. Ser., 1932, Vol. XVI, pt. x, pp. 3, 4.

One specimen of this species was collected on sandal at Aiyur, May, 27, 1931.

2. *Exocentrus pubescens* Fisher.

Exocentrus pubescens Fisher, Indian Forest Records, Ent. Ser., 1932, Vol. XVI, pt. x, pp. 9, 10.

Specimens of this species were collected at Jawalagiri, May 11-21, June 16, and July 11, 1930, and at Aiyur, September 23, 1930.

3. *Exocentrus vittatus* Fisher.

Exocentrus vittatus Fisher, Indian Forest Records, Ent. Ser., 1932, Vol. XVI, pt. x, pp. 12, 13.

The type of this species was collected at Jawalagiri, May 30, 1930, and the two paratypes were collected at Fraserpet, September 21 and October 6, 1930.

4. *Exocentrus trifasciatus* Fisher.

Exocentrus trifasciatus Fisher, Indian Forest Records, Ent. Ser., 1932, Vol. XVI, pt. x, pp. 13, 15.

Specimens of this species were collected at Fraserpet, March 25, May 12-15, September 14, October 11, and November 14, 1930.

5. *Exocentrus santali*, new species.

Male.—Above and beneath uniformly brownish-yellow, and each elytron ornamented with three distinct, transverse, zigzag, whitish pubescent fasciae.

Head strongly transverse and nearly flat in front, subequal in width to pronotum at apex, flat between the antennal tubercles, which are feebly elevated and widely separated; surface with a narrow, longitudinal groove extending from epistoma to occiput, rather coarsely but not very densely granulose, rather densely clothed with long, recumbent, yellowish pubescence, with a few long, erect, brownish hairs intermixed; mandibles brownish-yellow, blackish toward apices; palpi dark brown, with the tips paler; eyes large, deeply emarginate, and separated from each other on the top by nearly twice the width of the upper lobe. Antenna slightly longer than the body, uniformly brownish-yellow, sparsely clothed with short, recumbent, whitish and yellowish pubescence, with numerous long, erect hairs intermixed, rather densely ciliate beneath with long, erect, black hairs, and the joints feebly, narrowly annulated at bases with white pubescence; first joint long, robust, cylindrical, slightly expanded at middle, and extending to basal third of pronotum; third joint slightly shorter than first joint and subequal in length to the fourth.

Pronotum one and one-half times as wide as long, slightly narrower at base than at apex, and widest near middle; sides arcuately expanded from apical angles to a small, acute tooth on each side just behind the middle (tooth short, slender, and pointing obliquely backward), then strongly, obliquely narrowed to the base; surface feebly convex, feebly, broadly, transversely depressed along base, coarsely but not very densely granulose, sparsely clothed with long, recumbent, whitish pubescence,

which is slightly denser at middle and on each side, and with a few long, erect, black hairs intermixed. Scutellum broadly rounded at apex, and rather densely clothed with long, recumbent, whitish pubescence.

Elytra nearly four times as long as pronotum, and at base wider than pronotum at middle; sides parallel from base to apical third, then arcuately narrowed to the tips, which are conjointly, broadly rounded; disk moderately convex; surface rather densely, coarsely, irregularly punctate from bases to apices, sparsely clothed with short, recumbent, brownish pubescence, with numerous long, erect, stiff, black hairs intermixed, and each elytron ornamented with white pubescent markings as follows: a broad, transversely arcuate fascia extending from humerus to sutural margin at basal third, then narrowly along the margin to scutellum, a narrow, transversely zigzag fascia at middle, a narrow, transverse, irregular fascia near apex, the fascia narrowly connected along sutural and lateral margins to the median fascia, and enclosing a large, irregular, dark spot.

Beneath feebly, finely, densely punctate, rather densely clothed with long, recumbent, whitish pubescence, with numerous long, erect hairs on the legs; last abdominal segment broadly subtruncate at apex.

Female.—Differs from the male in having the last abdominal segment strongly convex, broadly, arcuately emarginate at apex, and broadly depressed behind the apical margin.

Length, 5.2 mm.; width 1.8 mm.

Type locality.—MADRAS: North Salem, Jawalagiri.

Other locality.—MADRAS: Palghat, Sappal (1,700 feet elevation).

Type.—British Museum. *Allotype*.—United States National Museum, Washington.

Described from a male and female (male type). The male was collected at the type locality October 7, 1930, in connection with the Forest Research Institute Sandal Insect Survey, and the female was reared from dry sticks collected at Sappal, October 5, 1930, by J. C. M. Gardner. The allotype is more reddish-brown than the type, and the white pubescent markings on the elytra are slightly rubbed.

This species resembles *dalbergiae* Fisher, but that species differs from *santali* in having the head and pronotum more densely granulose, the erect hairs on dorsal surface of body much longer and more conspicuous, the tooth on each side of the pronotum pointing almost directly backward, the eyes more narrowly separated from each other on the top, and the white pubescence forming more or less distinct designs on the pronotum.

6. *Exocentrus beelsoni*, new species.

Male.—Above and beneath uniformly dark reddish-brown, and the elytra irregularly variegated with small, whitish pubescent spots.

Head strongly transverse and nearly flat in front, subequal in width to pronotum at apex, feebly, broadly concave between the antennal tubercles, which are slightly elevated and widely separated; surface with a narrow, longitudinal groove extending from epistoma to occiput, rather coarsely but not very densely granulose, rather densely clothed with long, recumbent, whitish and yellowish pubescence, with a few long, erect, brownish hairs intermixed; mandibles reddish-brown, with the tips black; palpi brownish-yellow, with the tips slightly paler; eyes large, deeply emarginate, and separated from each other on the top by nearly twice the width of the upper lobe. Antenna considerably longer than the body (broken), uniformly dark reddish-brown, sparsely clothed with moderately long, recumbent, whitish pubescence, with a few long, erect hairs intermixed, rather densely ciliate beneath with long, erect, dark brown hairs, and the joints feebly, narrowly annulated at bases with white pubescence; first joint long, robust, cylindrical, slightly expanded at middle, and extending to basal third of pronotum; third joint slightly shorter than first joint, and subequal in length to the fourth.

Pronotum one and one-half times as wide as long, slightly narrower at base than at apex, and widest at middle; sides arcuately expanded from apical angles to a small, acute tooth on each side at middle (tooth moderately long, rather slender, and pointing almost directly backward) then strongly, obliquely narrowed to the base; surface feebly convex, feebly, broadly, transversely depressed along the base and anterior margin, rather coarsely but not very densely granulose, rather densely clothed with long, recumbent, whitish and brownish pubescence, the white pubescence more distinct on median part and toward the sides, and with a few long, erect, dark brown hairs intermixed. Scutellum broadly rounded at apex, and rather densely clothed with long, recumbent, whitish pubescence.

Elytra three and one-half times as long as pronotum, and at base distinctly wider than pronotum at middle; sides parallel from base to apical third, then arcuately narrowed to the tips, which are conjointly, broadly rounded; disk moderately convex, and slightly uneven; surface coarsely, irregularly punctate, more densely basally, sparsely clothed with rather short, recumbent, brownish and yellowish pubescence, with a few long, erect, stiff, black and brownish hairs intermixed, and irregularly ornamented with numerous small, white pubescent spots.

Beneath feebly, finely, densely punctate, rather densely clothed with long, recumbent, whitish pubescence, with numerous long, erect hairs on the legs; last abdominal segment broadly rounded or subtruncate at apex.

Female.—Differs from the male in having the last abdominal segment strongly convex, and broadly, arcuately emarginate at apex.

Length, 5.2—5.6 mm. width, 2—2.2 mm.

Type locality.—MADRAS : North Salem, Aiyur.

Type.—British Museum. *Allotype.*—United States National Museum, Washington.

Described from a male and female (male type), which were collected at the type locality, October 17 and November 6, 1930, in connection with the Forest Research Institute Sandal Insect Survey. In the allotype the white pubescent markings on the elytra are more distinct than in the type.

This species is allied to *alboguttatus* Fisher, but that species differs from *beesoni* in having the white pubescent markings on the elytra more distinct, narrower, arranged in longitudinal rows, and each elytron ornamented with an obliquely transverse, whitish pubescent fascia behind the middle.