

FURTHER NOTES ON THE INDIAN SPECIES OF *RODOLIA* MULSANT (COLEOPTERA: COCCINELLIDAE).

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In an earlier paper¹ on the Indian species of *Rodolia* Mulsant, I had listed nine species including an introduced Australian species, *Rodolia cardinalis* (Mulsant). Since its publication I had the opportunity of examining the collections in the Zoological Survey of India (Indian Museum) and some further material from other institutions in India, principally from the Directorate of Plant Protection, Quarantine and Storage. As a result of this study two more species (one of them new and the other hitherto recorded only from Burma) are now added to the earlier list and described with the same standard as was done for the previous paper. A revised key to the species and additional records of their geographical distribution, where available, are also given. Synonymies and most of the references for the species dealt with in my earlier paper have been omitted; for these a reference may be made to that paper. The material from various institutions is indicated as follows:—

Z. S. I.=Zoological Survey of India, Indian Museum, Calcutta.

P. P. A.=Directorate of Plant Protection, New Delhi.

I. A. R. I.=Indian Agricultural Research Institute, New Delhi.

B. M.=British Museum (Natural History), London.

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Rodolia fumida Mulsant.

1949. *Rodolia fumida*, Kapur, *Bull. ent. Res.* XXXIX, p. 534, figs. 1-3, 12, 15.

The material examined is from the following localities:—

India²: Ganohala Reserve Forest, ca. 4 miles from Choa Saidan Shah, Salt Range.

Punjab, 2. v. 1931 (*H. S. Pruthi*); 8 ex., Z.S.I., Reg. Nos. $\frac{7843}{H4}$ — $\frac{7850}{H4}$

Kangra Valley, Punjab, 4,500 ft., -vii 1908 (Dudgeon) (1 example, *B. M.*).

Lahore, Punjab, 7. v. 1908 (*N. Annandale*); 3 ex., Z.S.I., Reg. Nos. $\frac{5270}{H4}$,

$\frac{5274-5}{H4}$. Lahore, on *Aleurodes citri*, 18.v. 1913; 1 ex., Z.S.I., Reg.

No. $\frac{5721}{H4}$ Dehra Dun, U. P., -ii. 1901 (*F. Gleadon*); 1 ex., Z. S. I.

¹ Kapur, A. P., *Bull. ent. Res.* XXXIX, p. 531-538 (1949).

² Used throughout in the same sense as was the case before the partition of the country.

Reg. No. $\frac{1904}{14}$. Cherrapunji, Assam, 2-8.x. 1914 (S. W. Kemp);
 1 ex., Z. S. I., Reg. No. $\frac{7834}{H4}$. Pusa, Bihar, preying on *Monophlebus*,
 20.iv. 1918 (Haq) (3 ex., I. A. R. I.). Jubbulpur, C. P., 28. v. 1922
 (S. H. Ribeiro) 1 ex., Z. S. I., Reg. No. $\frac{5272}{H4}$. Bandra, Bombay, (Dr.
 Jaykar) (1 ex., B. M.).

Remarks.—A widely distributed species, already recorded from various parts of India and from Burma and Ceylon.

Rodolia guerini (Crotch).

1949. *Rodolia guerini*, Kapur, *Bull. ent. Res.* XXXIX, p. 535.

The material examined is from the following localities :—

India: Dehra Dun, U. P., predacious on *Monophlebus stebbingi*,—iv. 1909
 (E. P. Stebbing) 22 examples, Z. S. I., Reg. Nos. $\frac{4309}{14}$ — $\frac{4323}{14}$ Sikkim
 Singhik, 3,500 ft., 23.iv. 1924 (R. W. G. Hingston) (1 ex., B. M.). Cape
 Comorin, South India, feeding on *Icerya pilosa* 16.vi.1949 (V. K. S.);
 3 ex., P. P. A.'s bequest to Z. S. I., Reg. Nos. $\frac{7853}{H4}$ — $\frac{7855}{H4}$.

Remarks.—In one example from Dehra Dun, the two anterior black spots on the elytron are large and almost confluent with each other; in the material from Sikkim and from Cape Comorin these spots are completely fused to form a transverse band. The Cape Comorin examples agree more closely with Crotch's description. Though smaller in size and subhemispherical, their genital structure and other characters are similar to those of the rest of the material.

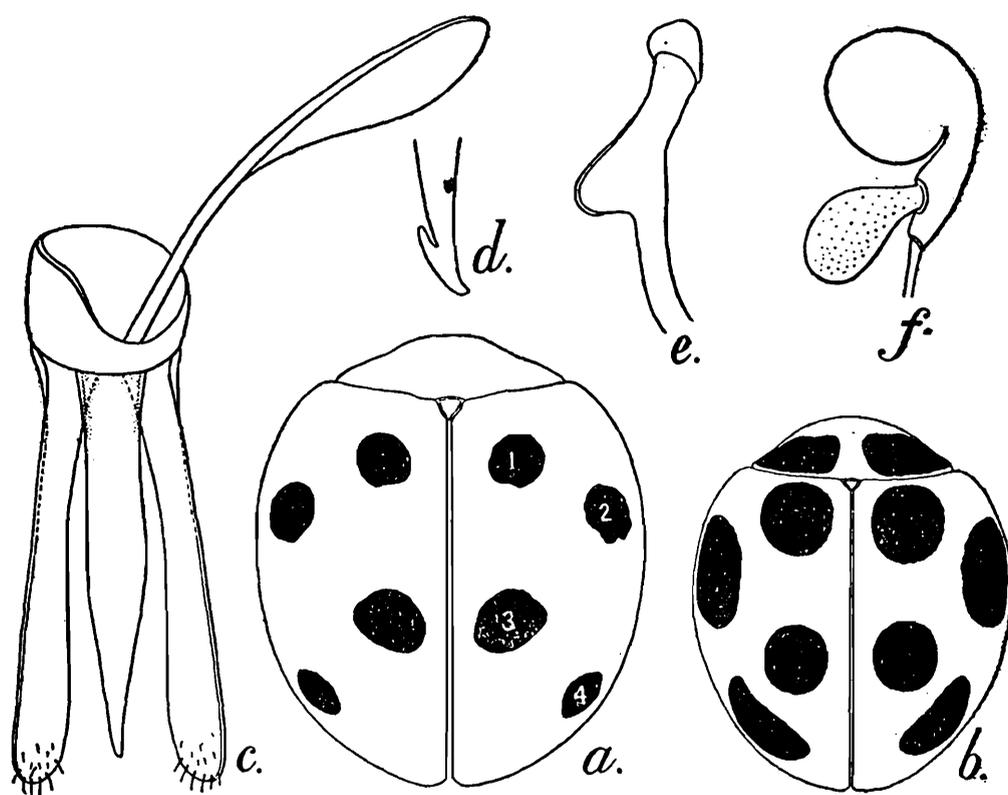
Previously recorded from Pondicherry (South India; type-locality) and the United Provinces, it is now being recorded from as far north as Sikkim.

Rodolia octoguttata Weise.

1910. *Rodolia octoguttata*, Weise, *Verh. Naturf. Ver. Brünn.* XLVIII, p. 51.

Body medium sized, subhemispherical; dorsal surface reddish brown to testaceous; pronotum with a pair of large, ill-defined, black to fuscous spots situated near the base and on either side of the longitudinal median line of pronotum; the spots in some examples are further enlarged and fused with each other but in another example they are altogether missing. Scutellum without any black or fuscous marking. Each elytron with four subrounded, rather large to small, black spots which are generally of uniform size in the same example. Numbering the spots on the left elytron (Text-fig. 1a) from left to right and from the base to apex, the first and third spots are situated closer to the suture while the second and fourth spots are near the external margin. The first spot is as distant from the base and the transverse middle line of the elytron as from the suture; the second begins from about the same level as the centre of the first spot and extends to a little distance below the transverse median line of elytron in the case

where the spots are large, (Text-fig. 1b) but otherwise it stops short near the said line; the third spot which is situated in line behind the first, extends from the transverse median line to as far back as $3/5$ — $7/10$ th the length of elytron; the fourth or the subapical spot is equidistant from the second and third spots and the external margin. Underside of the same colour as the dorsal or slightly paler, in some cases with the parts of metathorax and the last two pair of femora fuscous. Pubescence grey, moderately long and dense except for the head and underside where it is short and rather depressed. Punctuation fairly close and fine on the head and pronotum, rather coarse and impressed on the elytra, much more so than in *R. guerini*. Scutellum with the pubescence and punctuation similar to that of the elytra. Pronotum with the anterior angles and the lateral margin subrounded; elytra with the shoulder-boil



TEXT-FIG. 1.—*Rodolia octoguttata* Weise. a. showing elytral pattern: $\times 8$; b. another pattern: $\times 8$; c. male genitalia (front-view) except siphon: $\times 10$; d. apex of penis (side-view): $\times 10$; e. siphonal capsule: $\times 10$; f. spermatheca: $\times 10$.

indistinct. Prosternum narrow, nearly two-and-half times as long as wide, slightly narrowed and raised anteriorly. The apical margin of the sixth abdominal sternite of the male notched in the middle; entire and subrounded in the female. Male genitalia (Text-fig. 1c-e) similar to that of *R. fumida* but differs from the latter in that the penis instead of being very pointed near the apex, as is the case in *fumida*, tapers very gradually from the middle of its length to the apex which is less sharply pointed (Text-fig. 1c); its subapical projection (Text-fig. 1d) is also larger and more deeply notched. Siphonal capsule (Text-fig. 1e) also similar to that of *fumida* but with the inner lobe narrower and shorter. Female genitalia, including the shape of the spermatheca (Text-fig. 1f), like that of *fumida*.

Length 3.5—5.0 mm.; width 3.2—4.6 mm.

Geographical distribution.—Type-locality : Pegu, Upper Burma. The material examined is from the following localities :—

India : Bhim Ku, Talkumaon Hills, U. P., 18.v.1930 (*H. S. Pruthi*) 1; ♀, *Z. S. I.*

Reg. No. $\frac{5294}{H4}$. Shillong, Khasi Hills, Assam, 5.xi.1930 (*H. S. Rao*):

2 ♂, 1 ♀; *Z. S. I.*, Reg. No. $\frac{5292}{H4}$.

Burma : Hmodon, 3,900 ft. Upper Burma, 5.v.1918.; 1 ♂, *Z. S. I.*, Reg.

No. $\frac{7864}{H4}$.

Remarks.—This species falls in the same group as the *R. fumida*, *R. guerini* and *R. andamanica* Weise by the general shape of the body, and the characteristic subapical projection of penis, but is easily distinguishable from them by its markings on the pronotum and elytra.

***Rodolia breviscula* Weise.**

1949. *Rodolia breviscula*, Kapur, *Bull. ent. Res.* XXXIX, p. 536, figs. 6, 11, 21.

The material examined is as follows :—

India : Poshok, 2,500 ft., Darjeeling district, Bengal, 26.v—14.vi.1916 (*F. H.*

Gravelly) 1 ex., *Z. S. I.*, Reg. No. $\frac{5715}{H4}$. Whitefield, Bangalore, Mysore.

State, on *Icerya purchasi* Maskell, (*V. K. Subramanyam*); 2 ex., *P. P. A. S.*,

bequest, *Z. S. I.* Reg. No. $\frac{808-9}{H4}$. Coorg, South India, feeding on *I.*

purchasi and *Icerya aegyptiaca* Douglas, 18.ix.1949; 4 ex., *P. P. A.*; 3 ex.

Z. S. I., Reg. Nos. $\frac{7851}{H4}$ — $\frac{7852}{H4}$.

Burma : Pyinmana (Lower Burma) 7.iii.1918, (*Y. R. Rao*); 1 ex., *I. A. R. I.*

1 ex., *Z. S. I.*, Reg. No. $\frac{7841}{H4}$

Remarks.—Previously known from the Central and Southern India and from Ceylon, this species is now being recorded from Lower Burma and may in fact be more widely distributed than is known at present.

***Rodolia amabilis* Kapur.**

1949. *Rodolia amabilis*, Kapur, *Bull. ent. Res.* XXXIX, p. 536, figs. 7, 13, 18.

The material examined is from the following localities :—

India : Calcutta, Bengal, predacious on *I. aegyptiaca*, 27. xi. 1894; 24 examples

Z. S. I., Reg. Nos. $\frac{6191}{13}$ — $\frac{6209}{13}$ Puri, Orissa coast, 24-28.i.1911 (*N.*

Annandale & *F. H. Gravelly*; 1 ex., *Z. S. I.*, Reg. No. $\frac{7833}{H4}$. Barkuda

Island, Chilka Lake, Orissa, 9.ix.1920, (*N. Annandale*); 1 ex., *Z. S. I.*

Reg. No. $\frac{7842}{H4}$. White field, Bangalore, feeding on *I. purchasi*, 18.ix.1949

(*V. K. Subramanyam*); 1 ex., *P. P. A.'s* bequest, *Z. S. I.*, Reg. No. $\frac{7859}{H4}$.

Coorg, South India, feeding on *I. purchasi* and *I. aegyptiaca*; 3 ex., *P. P. A.'s*

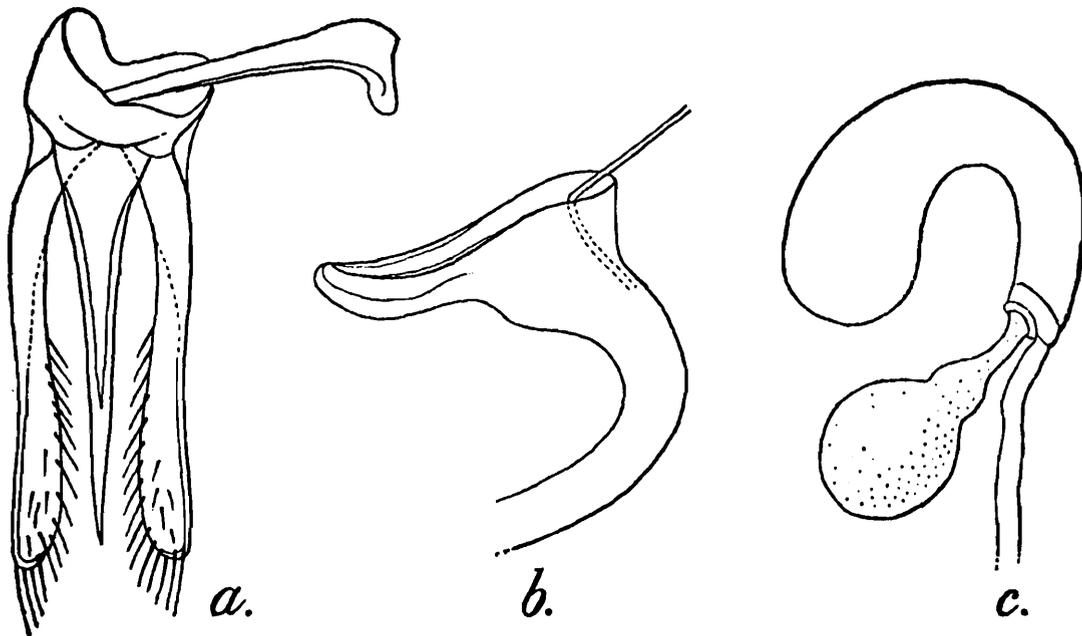
bequest, *Z. S. I.*, Reg. Nos. $\frac{7856}{H4}$ — $\frac{7858}{H4}$

Ceylon : Ragalla, attacking *I. purchasi*, 19.xi.1917 ; 6 ex., *Z. S. I.*, Reg.

Nos. $\frac{7835}{H4}$ — $\frac{7840}{H4}$.

***Rodolia nigrofrontalis*, sp. nov.**

Body subhemispherical, closely resembling *R. amabilis* in size and outline. Head piceous except for the antennae and mouth-parts which like the rest of dorsal surface are uniformly reddish brown with a slight tinge of carmine. Underside piceous except for the epipleurae (of both pronotum and elytra), the apices of femora, the tibia and tarsi and the external margin of abdomen. Pubescence yellowish, short, moderately dense and a little slanting on the dorsal surface and almost depressed on the underside. Punctuation fine, moderately impressed and close on the head and pronotum except for a few scattered coarser punctures on the latter ; elytral punctures, as a rule rather coarse, fairly close and shallowly impressed. Prosternum very small, at the apex rather squarish. Sixth abdominal sternite in the male weakly emarginate at



TEXT-FIG. 2.—*Rodolia nigrofrontalis*, sp. nov. a. male genitalia, except siphon : $\times 14$; b. siphonal capsule : $\times 22$; c. spermatheca : $\times 22$.

apex ; entire and rounded in the female. Male genitalia (Text-fig. 2 a) similar to that of *amabilis* but with the penis distinctly narrower and sharply pointed towards the apex ; paramera spathulate, with the distal half to two-thirds being closely beset with long setae ; siphon (Text-fig. 2 b) as in *amabilis* except that the inner lobe of the siphonal capsule is shorter and narrower. Female with the spermatheca (Text-fig. 2 c) curved like a semicircle and slightly but gradually increasing in width towards the apex which is rounded.

Length 3.0—3.2 mm. ; width 2.45—2.7 mm.

Holotype.—A male from Travancore, South India, 1948 P. P. A.'s bequest, in *Z.S.I.*, Reg. No. 7861/H4. *Allotype*.—A female with the same data as the above, in *Z.S.I.*, Reg. No. 7862/H4 ; *Paratype*.—Three, with the same data as the above, one each in *Z.S.I.* (Reg. No. 7863/H4) ; the P. P. A.'s collection and in the British Museum (N.H.).

Remarks.—Very close to *R. amabilis* from which it is readily distinguished by the black front of the head, the coarser punctures on the elytra and by the structure of the genitalia.

Rodolia minima Kapur.

1949. *Rodolia minima*, Kapur. *Bull. ent. Res.* XXXIX, p. 537-538, figs. 8, 9, 19, 20.

The material examined is from the following locality :—

India: Ooty, Nilgiri Hills, South India, 11.vii.1928, (*T. V. Subramaniam* ;

2 ex., *Z. S. I.*, Reg. Nos. $\frac{2739}{H4}$; $\frac{2740}{H4}$

Remarks.—Already known from Ooty (not 'Coty' as given by mistake in my earlier paper) which is the type-locality.

KEY TO THE INDIAN SPECIES.

1. Elytra reddis brown to carmine-red, with black spots .. 2
Elytra pusually uniformly yellowish brown, brown, reddish or carmine-red, rarely fuscous, sometimes fuscous only along the margins or at the adices. .. 5
2. Elytron with one small, black spot situated a little anterior to the middle and as distant from the suture as the length of its own diameter ; body 3.25 mm. long (South India)
Elytron with more than one black spots ; body longer than 3.5 mm. 3
3. Elytron with 3 or 4 black spots, without the black sutural and apical borders 4
Elytron with the black sutural and apical borders and with two black spots : one curved round the inner side of the shoulder-boil and the other discal, at $\frac{3}{5}$ ths the length of elytron and appearing as if composed of two fused spots. (Australian species, widely distributed in the world, introduced in India, mainly in the South) .. *cardinalis* (Mulsant)
4. Elytron with 3 black spots : two placed transversely a short distance before the middle and one (oval) in the apical third of elytron ; the former spots sometimes enlarged and fused to form a transverse band. Body usually subovate. (India) .. *guerini* (Crotch)
Elytron with 4 black spots, each situated at different levels and not forming a transverse band : the first near the scuteller angle, the second below the shoulder-boil, the third near the suture and immediately below the transverse median line and the fourth subapical. Body usually subhemispherical. (India ; Burma) .. *octoguttata* Weise
5. Head with the exception of antennae and mouth-parts black : body subhemispherical. (S. India) .. *nigrofrontalis* sp. nov.
Heads not at all black ; body shortly oval or subhemispherical : 6
6. Body shortly oval, 5-5.6 mm. long ; elytra entirely or partly testaceous, reddish testaceous, nearly red or light piceous, some times only the margins or part of them fuscous ; median part of prosternum narrowed and less conspicuously raised anteriorly, (widely distributed in India) *fumida* Mulsant
Body subhemispherical, median part of prosternum more distinctly raised 7
7. Body small, nearly 2.3 mm. long ; head, prodtum and greater part of elytra reddish testaceous to carmine-red, the apical third and lateral borders of elytra darker. (South India) .. *minima* Kapur
Body medium to large, 3 mm. long or over .. 8
8. Body nearly 6 mm. long ; head and pronotum and orange-yellow, elytra reddish brown, with the external border orange. (N. India) *ruficollis* Mulsant

- Body less than 5.5 mm. long ; head, pronotum and elytra uniformly coloured .. 9
9. Body 4.8-5.2 long ; rusty, opaque and matt, finely and closely punctate with long, yellowish and sparser pubescence ; anterior angles of pronotum broadly rounded. (Andaman Islands) .. *andamanica* Weise
- Body 3-4.25 mm. long ; upper surface shiny, anterior angles of pronotum narrower ; pubescence denser and shorter 10
10. Body usually larger (3-4.25 mm. long) ; pubescence greyish or slightly yellowish and moderately dense ; elytral punctures rather shallow. (India, Burma and Ceylon) *breviuscula* Weise
- Body smaller (3 mm. long) ; pubescence yellowish and close ; elytral punctures closer and more impressed (India) *amabilis* Kapur