

A NOTE ON *EPILACHNA OCELLATA* REDT. (COLEOPTERA :
COCCINELLIDAE), WITH DESCRIPTIONS OF THREE SPECIES
HITHERTO CONFUSED WITH IT.

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INTRODUCTION.

Recently, Dr. S. L. Hora, Director of this Survey, brought a number of examples of *Epilachna ocellata* Redtenbacher, which were found damaging potato plants in a field situated about one and a half miles on the road from Naggar to Manali (ca. 8,000 ft. ; Kulu Sub-Division, Punjab, India) on the 15th June, 1950. On the average six beetles were found on a plant. The infestation was also observed in other fields further up on the above-mentioned road.

These observations are of special interest because hitherto no information was available on the host-plant of this member of the vast sub-family Epilachninae which is mostly herbivorous. Its attack on potato is of further interest owing to the importance of the crop in those tracts. I am grateful to Dr. Hora for permitting me to record his above-mentioned observations and for placing at my disposal the material for study. He has also been generous in affording me facilities for work.

Epilachna ocellata is of further interest from the point of view of systematics and geographical distribution. Redtenbacher¹ (*in* Hügel, 1944) first described it from Kashmir ; six years later, in 1850, Mulsant² described *Epilachna oculea* from Nepal and considered it to be closely related to *ocellata*. Mulsant reported variations in the pronotal markings of *oculea* and named a variety as *retexta*. In 1874 Crotch³ synonymized *oculea* with *ocellata* and observed that his material also showed considerable variation in the markings. Subsequent workers followed the synonymy proposed by Crotch and recorded the species from several

¹ Redtenbacher, L., (*in* Hügel) "Kaschmir und das Reich der Seik. . . ." IV, pt. 2, pp. 497-564, 6 pls. (1844).

² Mulsant, E., *Ann. Soc. Agric. Lyon* (2) III, pp. 1-1104 (1850).

³ Crotch, G.E., A revision of the coleopterous family coccinellidae, 311 pp. (1874).

other places in India. In 1895, Weise¹ recorded it from Barway (Bengal), while in 1924 Subramaniam² reported it (with a query) from Coorg and Godavari in South India, and Beeson³, in 1941, gave its distribution as Himalayas to South India. From these records it would appear that the species, besides being variable, is widely distributed in India. Recently, however, Dieke⁴ (1947) stated that the long series of the species that he had examined from Kulu, and various places in Uttar Pradesh (U.P.), were uniform. An examination, by the present writer, of the material placed under *E. ocellata* in the collection of the British Museum (Natural History), London, and in the Indian Museum (Zoological Survey of India), Calcutta, revealed that in fact three other, somewhat variable but superficially similar, species were involved. This fact apparently seems to have been responsible for some of the earlier records regarding its wider distribution and variability.

The material from South India belongs to two hitherto undescribed species and there is another new species from Manipur, Assam. *Epilachna ocellata* seems to be distributed in the Himalayas, between Kashmir and Darjiling (see map, text-fig. 4). The material from Nepal (type-locality for *oculea* Mulsant) agreed in description with the examples from the Western Himalayas, from where *ocellata* was first described; thus the earlier synonym proposed by Crotch remains unchanged.

II. DESCRIPTIONS OF THE SPECIES.

Epilachna ocellata Redtenbacher.

1844. *Epilachna ocellata*, Redtenbacher (in Hügel), "Kaschmir und das Reich der Siek", IV, pt. 2, pp. 497-564, 6 pls. (Type-locality : Kashmir).
 1850. *Epilachna ocellata*, Mulsant, *Ann. Soc. Agric. Lyon* (2) III, pp. 792-793
 1850. *Epilachna oculea*, Mulsant, *Ann. Soc. Agric. Lyon* (2) III, pp. 791-793 (Type-locality : Nepal).
 1874. *Epilachna ocellata*, Crotch, *A revision of the coleopterous family Coccinellidae*, p. 89.
 1874. *Epilachna oculea*, Crotch, *A revision of the coleopterous family Coccinellidae*, p. 87 (Synonymized with *ocellata*).

Body shortly oval, convex, most so in the middle; pubescence greyish except on the six black spots on elytron, where it is black. Head brown to dark brown with a piceous ill-defined marking on the vertex; eyes black. Pronotum brown, with five black spots (Text-fig. 1, *d*) which are sometimes enlarged and fused; when distinct these are arranged as follows: the largest spot situated in the middle, elongate, irregular in outline, extending from the base to the anterior margin and about as wide as one-fourth the width of pronotum. A pair of smaller spots situated obliquely on either side of the median spot, the proximal one of these spots usually smaller than the distal one, situated near the base and at equal distance from the posterior angle and the median spot; the distal spot larger, subquadrate to oblong, situated in the middle

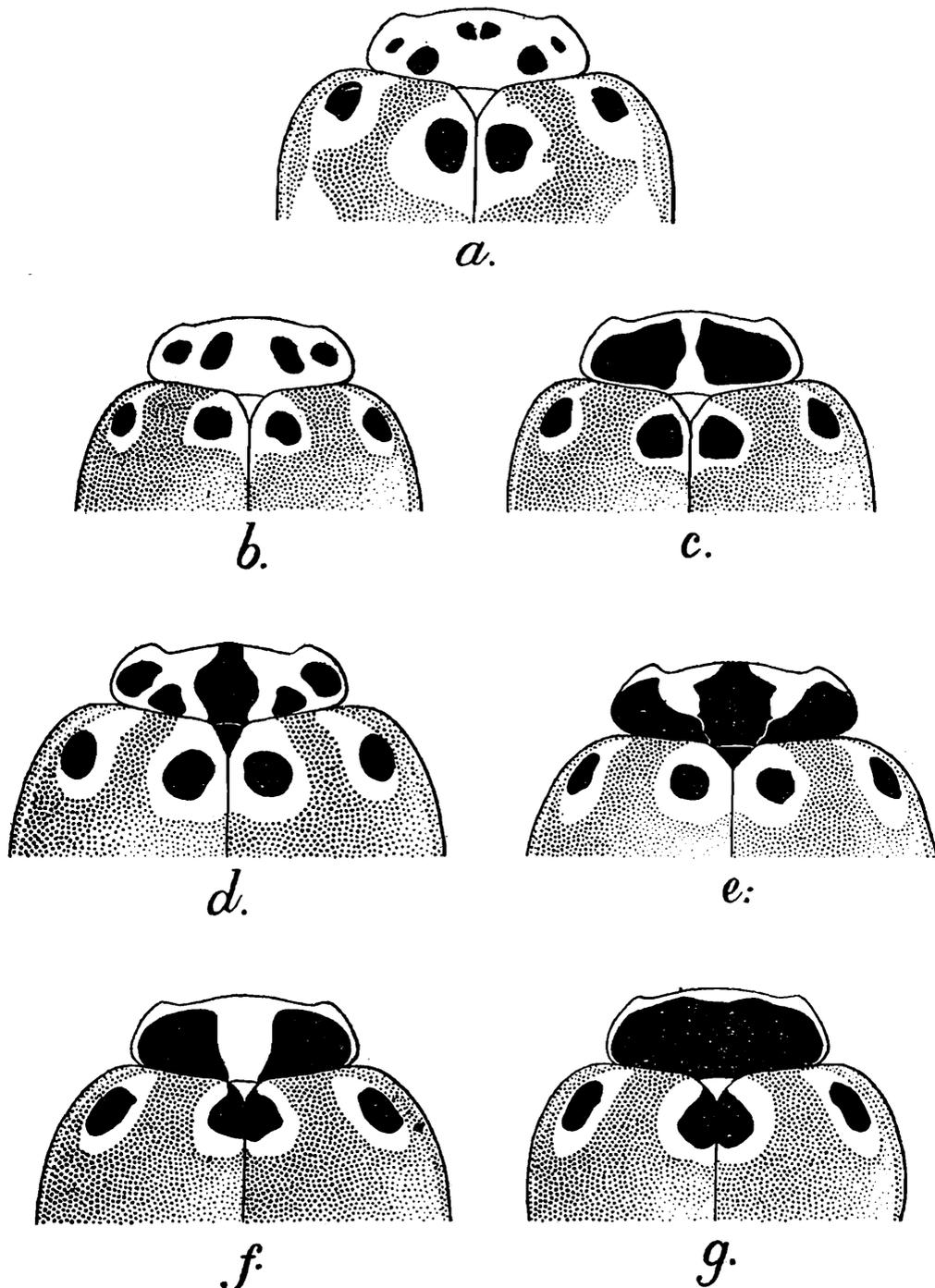
¹ Weise, J. *Jour. Ann. Soc. Ent. Belgique* XXXIX, pp. 120-146 (1895).

² Subramaniam, T. V. *Rep. Proc. fifth ent. Meetings, Pusa*, pp. 108-118. (1924).

³ Beeson, C.F.C. "The Ecology and control of forest insects....." 1007 pp. (1941).

⁴ Dieke, G. H. *Smitason. Miscell. Colin.* CVI, No. 15, 183 pp. (1947).

of and close to the lateral margin. In most cases the latter spot is much enlarged and almost touches the proximal spot. In extreme cases when all the spots are enlarged and fused (Text-fig. 1, *e*), the entire pronotum is black except for a brownish, narrow, irregular border along the anterior margin. Scutellum black throughout. Elytron with six black spots, each spot surrounded by brown to rather light brown ring



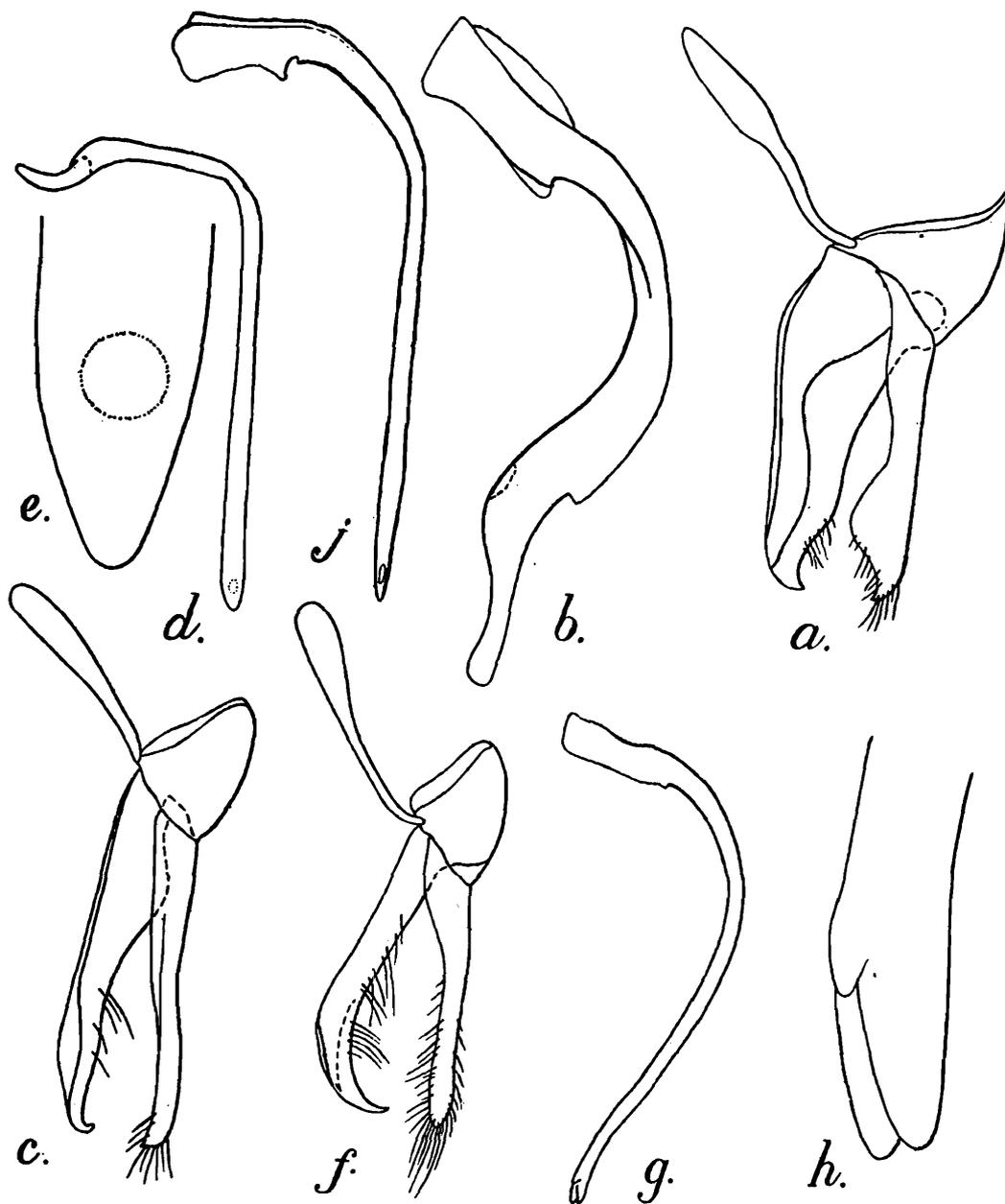
TEXT-FIG. 1.—Pronotum and the anterior part of elytra of: *a. Epilachna anita* sp. nov. *b-c. E. nana*, sp. nov.; *d-e. E. ocellata* Redt.; *f-g. E. manipurensis*, sp. nov.-(all figs. X 8).

of moderate width except for spot No. 4 (the spots are numbered according to their position on the right elytron, from left to right and from base to apex) which is produced laterally to reach the external margin and where the ring is left incomplete. The remaining area on the elytron dark brown to piceous. Elytral spots arranged as follows: No. 1 or scutellar

spot, small to moderately large, rounded, with the anteriormost margin at level with the apex of scutellum, slightly closer to the suture than to the base; spot No. 2 also rounded, usually moderately large and situated on the shoulder boil; spot No. 3 almost rounded to a little transverse oval, situated a little anterior to the middle of elytron, farther away from the suture than either spot 1 or 5. Spot No. 4 usually larger than No. 3, subrounded to quadrate, expanded laterally to reach the external margin and situated almost in the middle of the latter; spot 5 subrounded to transverse oval or subquadrate, slightly smaller than spot 3, situated at about three-fifths the length of elytron and as near the suture as spot No. 1. Spot No. 6 of about the same size as spot No. 2, subrounded to transverse oval, situated at about four-fifths the length of elytron and relatively closer to the external margin than to the suture. Underside usually dark brown to piceous except for the light brown mouth-parts, prothoracic epipleurae and prosternum, elytral epipleurae and legs, a light patch near lateral margins on each of the first four abdominal sternites and a similar patch in the middle of the apical margin of the fifth sternite. Sometimes trochanter and base of the femur and the median part of the elytral epipleuron piceous in colour.

Head minutely and fairly closely punctate; pubescence long and moderately close. Pronotum widely emarginate anteriorly, the anterior angles and lateral margins widely rounded and slightly elevated; punctation and pubescence similar to that on the head. Scutellum triangular, with the sides trifling longer than the base, apex pointed, punctation and pubescence similar to that on the head. Elytra with a less conspicuous shoulder-boil; shoulder angle widely rounded, external margin bordered but not raised to form a channel; apical angle rounded and not making a sharp point with the suture; punctures of two kinds, coarser punctures sparser and moderately impressed; finer punctures nearly as fine as those on the head or the pronotum but relatively sparser; pubescence similar to that on the pronotum. Underside with the abdominal lines complete, subterminal and subangulate; punctation on abdominal sternites rather coarser and more impressed than on the metasternum; pubescence relatively short and less dense than on the upper surface. Fifth sternite in the male slightly longer than the preceding sternite; the sixth with a distinct emargination at the apex. In the female, fifth sternite broadly and shallowly emarginate, the median apical part being mostly glabrous and very minutely and sparsely punctate; sixth segment split longitudinally into two except for the median basal part which is produced like an arch which remains covered by the fifth segment (Text-fig. 3, *b*). Male genitalia with the siphon (Text-fig. 2, *b*) rather thick in the middle, the proximal two-thirds bent nearly in semicircle, the distal one-third straight and almost vertical; siphonal capsule tubular, slightly constricted in the middle and with a thin chitinous flap on the upper surface; orifice at two-thirds the length of siphon on the underside. Basal plate (Text-fig. 2, *a*) relatively less developed; penis well developed, larger than most other species in the genus, widest in the basal one-third of the length, thereafter narrowed gradually towards the apex; seen from the side, there is a slight bend in the middle of the upper surface and another one, slightly more prominent, just before the apex; a few short setae present in the area just

before the latter bend ; basal one-third of penis is a wide and oblique tube through which the siphon passes, the tube is continued on the underside as an open, rather shallow and moderately wide channel which becomes narrow at the subapical bend where it ends ; paramera nearly as long as penis, spoon-shaped, with a deep emargination on the outer side just before the apex, the apical one-third of paramera with a row of moderately long setae. Female genitalia with the subgenital plates (ix sternite) (Text-fig. 3, *d*) weakly emarginate for the greater length of the inner margin, and of the apical one-third of the outer margin, stylus rather well developed, with five or six long setae at its apex ; tenth tergite subtruncate in the middle, slightly rounded at the sides.



TEXT-FIG. 2.—Male genitalia : *a.* side view of basal-plate, penis, paramera, etc. of *Epilachna ocellata* (X 27) ; *b.* siphon of the same (X 27) ; *c.* penis, paramera, etc. of *E. manipurensis* (X 27) ; *d.* siphon of the same (X 27) ; *e.* apex of siphon of the same (X 200) ; *f.* penis, paramera, etc. of *E. nana* sp. nov. (X 27) ; *g.* siphon of the same (X 27) ; *h.* apex of siphon (X 200) ; *j.* siphon of *E. anita*, sp. nov. (X 27).

Length 6.0—7.2 mm ; width 5.6—6.0 mm.

Type-locality.—Kashmir, (for *E. ocellata* Mulsant : Nepal).

Material examined.—Forty-two examples as follows:—Gharial, ca. 6000 ft., Murree Hills, Punjab (P.) 19th September 1928, (H. S. Pruthi) (5260/H4). Naggar (1½ miles from Naggar on the road from Naggar to Manali), 15th June 1950, feeding on potato leaves, (S. L. Hora) (7957/H4-7968/H4). Simla, Punjab (I), 7000—8000 ft., 7th May 1910, (N. Annandale) (5257/H4); Phagu, ca. 9000 ft., Simla Hills, 18—21st May 1916, (N. Annandale and S. W. Kemp), (5258/H4); Kufri, ca. 7,000 ft., Simla Hills, 1st October 1925, (B. N. Chopra) (5253/H4. 5255/H4, (5256/H4). Almora, Kumaon Hills, U. P., 5th-10th August 1911, (C. Paiva), (5259/H4). Thangiet, 6000 ft., Nepal, (1949- British Museum Expedition); Trisuli to Rasua, 8000 ft., Nepal, (1949-B.M.E.); Rasua, 8000 ft.. Nepal, 1949-(B.M.E.). Sikkim, Eastern Himalayas (no further data available), (8888/7). Mungphu, Darjilling District, Bengal, (no further data available), (7955/H4-7956/H4).

Remarks.—The species is easily distinguishable from the other species described here by the large median pronotal spot which extends from the anterior to the basal margin, by the black scutellum, and by the position of the scutellar spots and the laterally extended spot No. 4 of the elytra which reaches the lateral margin. In the structure of the genitalia also *E. ocellata* is very distinct. In the female, the fifth segment has the arch-like prolongation; the subgenital plates have characteristic outline and the styli on them are better developed than is the case in any other species. In the male also the penis and siphon are greatly developed. In these characters of the genitalia, *ocellata* resembles some of the species from North-East India and the East Indies, such as *Epilachna tertia* Dieke from Assam and *Epilachna enneasticta* Mulsant, from Java and Sumatra. Dieke, who had not seen a female example of *tertia* at the time of describing the species did not point out the above mentioned similarity in the structure of the fifth sternite of the female but in his arrangement of the species, *tertia* comes next to *ocellata*, presumably on the basis of male genital characters. He also drew attention to the resemblance in the genitalia of *ocellata* and *enneasticta* group. Korschefsky¹ in his catalogue listed *ocellata* in the group of palaeartic species though structurally it does not show affinity to any known species of that group. On the other hand, it is possible that the characters in which it resembles *tertia* or *enneasticta* might have evolved independently in the various species. In the present state of our knowledge, however, it would seem more appropriate to regard it as a species that has evolved from the Indo-Malayan group and has spread from the East to the West Himalayas.

Epilachna nana, sp. nov.

Body similar in outline to that of *E. ocellata*, slightly smaller; pubescence also similar, being greyish except on the elytral spots where it is black. Head brown, without any piceous marking on the vertex, antennae and mouth-parts also brown, eyes black. Pronotum brown, testaceous at the anterior angles; usually with four piceous to black spots, all arranged in a row on the transverse median line (Text-fig. 1, b); the outer spot roundish, the inner or the one nearer the centre often oblong, the distance between the two inner spots is more than that between the outer and inner spots on the same side; sometimes the spots are enlarged and the two of the same side become confluent to form a large subquadrate

¹ Korschefsky, R., *Coccinellidae I, Coleopterorum catalogus*. ..(Junk Pub.) pars. 118, p. 24 (1931).

spot which almost touches the base of pronotum but it neither extends to the lateral and anterior margins nor to the median longitudinal line. Scutellum brown. Elytron with six black spots ; each spot including No. 4, surrounded by a brown to light brown ring of moderate width ; the remainder of the area rather piceous, dark brown or brown (in the last mentioned case the rings round the spots are lighter still). Arrangements of spots similar to that in *ocellata* except where indicated below. Spot No. 1 rounded, small to moderately large, nearer the base than is the case in *ocellata*, the front tangent of the spots passing through scutellum at two-thirds its altitude. Spot No. 2 of about the same size and shape as spot No. 1 ; spot No. 3 large, subrounded, a little wider than long ; spot No. 4 equal in size or smaller than the preceding spot, surrounded all round by the brown ring and situated close to but not touching the lateral margin. Spot No. 5 subrounded, equal in size to spot No. 4 or a little smaller ; No. 6 spot more variable in size than the other spots, smaller or larger than spot No. 5 in different examples, rounded to transverse oval. Underside brown except for a pair of dark brown to piceous patches on the metasternum ; slightly dark brown patches also present on abdominal sternites in some examples ; legs brown throughout.

Head minutely and fairly closely punctate, the punctures rather impressed ; pubescence moderately long, fine and rather sparse. Pronotum similar in outline to that of *ocellata* except that the lateral margins are relatively less rounded ; punctation and pubescence similar to that on the head. Scutellum triangular, as in *ocellata*, punctation very fine and fairly close ; pubescence similar to that on the pronotum. Elytra similar in outline to those of *ocellata*, without a sharp point near the apex of the suture ; punctures of two kinds, coarser punctures sparse and moderately impressed, finer punctures relatively less impressed than those on the pronotum ; pubescence similar to that on the pronotum. Underside with the abdominal lines complete, subterminal and slightly angulate ; abdominal sternites with relatively coarser, closer and more impressed punctures than those on the metasternum ; pubescence uniform, relatively short, fine and sparser than that on the upper surface. Male with the fifth sternite slightly longer than the fourth ; the sixth distinctly emarginate at the apex. In the female the fifth sternite distinctly longer than the fourth ; the sixth completely split longitudinally into two (similar to those shown in Text-fig. 3, *a*). Male genitalia with the siphon relatively thin (Text-fig. 2, *g*), regularly and widely curved in the proximal half, straight distally ; siphonal capsule a little wider than the siphonal tube, nearly twice as long as wide ; apex of siphon with a v-shaped notch having a slight indication of a third projection near the base of the notch (Text-fig. 2, *h*). Basal plate moderately developed ; penis like a narrow tube, nearly one-tenth as wide as long, subparallel and straight for two-thirds its length, the distal one-third gradually curved upwards and narrowed towards the apex which is sharply pointed ; opening of the penis on the underside, elongate oval, situated at two-thirds its length, the median half of the upper surface with a number of moderately long setae. Paramera slightly narrowed and shorter than penis, rounded at the apex, their distal half with long setae which

are more numerous towards the apex. Female genitalia with the subgenital plates subquadrate (Text-fig. 3, *e*), each plate about two-thirds as wide as long, maximum width also at two-thirds its length, widely curved distally and at the apical margin; inner margin notched near the base, the notch relatively shallow except in its distal part, the remainder of the inner margin straight; stylus very small in comparison to that in *ocellata*, with two or three setae which are longer than the other setae on the plate; tenth tergite subrounded.

Length 6.2 mm.; width 5.0 mm.

Type-specimens.—*Holotype*: male, INDIA, Nilgiri Hills, (*G. F. Hampson*); in the Zoological Survey of India, No. 3426/13 (entry in the register dated 18th March 1892).

Allotype: female, Nilgiri Hills, (*H. L. Andrewes*); in the British Museum.

Paratypes.—a male and two females; Cochin State, Parambikulam, 1700—3200 ft., 16-24. IX. 1914, (*F. H. Gravely*), a female, in the Z. S. I., No. 5262/H4. Nilgiri Hills, (*G. F. Hampson*), in the B. M.

Remarks.—The species is easily distinguished from *ocellata* by the markings on the pronotum, the brown scutellum, the position of the elytral spots No. 1 and 4; underside too is brown, as against black in *ocellata*. Both the male and female genitalia are very different in the two species as has been stated in the description. The shape of the male genitalia is very similar to that of *Epilachna boisduvali* Mulsant, although the penis is relatively narrower in *nana* and the apex of siphon slightly different in the two species. The female genitalia are, however, very different in the two species; the subgenital plates in *boisduvali* being widest in the basal one-third of their length and without an emargination on the inner margin. The species *boisduvali* is widely distributed in Australia, the Philippine Islands, Fiji, Samoa, etc.; its pronotum is usually without markings, and the elytral spots are without any kind of brown rings around them.

***Epilachna anita*, sp. nov.**

Body similar to that of *E. nana*; the pubescence also similar, being greyish except on the black elytral spots where it is dark brown. Head, antennae and mouth-parts brown; eyes black. Pronotum (Text-fig. 1, *a*) brown with six black spots of relatively smaller size, arranged in three pairs as follows: a pair of median, subquadrate spots situated in the middle of the pronotum, one on either side of the median longitudinal line and usually narrowly separated from each other but sometimes becoming confluent to form a single transverse spot; a lateral pair comprising a small and another relatively large spot situated in each half of the pronotum, the larger spot situated near the base and in the middle of the distance between the lateral margin and the median longitudinal line, the smaller spot situated a little anteriorly of the other spot and is about twice as far away from the median pair of spots as from the lateral margin. Scutellum brown. Elytron with six black spots, each surrounded by a ring of brown colour; the remainder of the elytral

surface dark brown to piceous. The spots similar to and arranged as in *nana* except that these are relatively smaller and the brown rings surrounding them are proportionately wider. Besides, spot No. 1 is situated distinctly away from the apex of the scutellum. Underside with the coloration similar to that in *nana*.

Head minutely and fairly closely punctate, pubescence moderately long and close. Pronotum with the anterior angles widely rounded; the lateral margins only slightly so, almost subparallel; punctation moderately fine, impressed and close; pubescence similar to that on the head. Scutellum as in *E. nana*. Elytra also similar, but with a minute point at the place where the suture meets the apical margin; punctation as in *nana*, pubescence also similar but shorter. Underside with the abdominal lines complete, subterminal and subangulate; abdominal sternites similar in structure to those of *nana*. Male genitalia with the siphon moderately developed (Text-fig. 2, j), slightly narrowing towards the apex, the proximal one-third moderately curved, the rest almost straight, siphonal capsule distinctly wider than the tube, approximately twice as long as wide and slightly constricted in the middle, apex of the siphon rather flattened, pointed, with the orifice elongate oval and situated just before the tip. Basal plate moderately developed; penis as in Text-fig. 2, c, when seen in profile, appearing broad in the basal half and much narrowed distally, its underside is straight for three-fourths its length, bent upwards in the apical one-fourth and with the apex pointed and curved upwards in the form of a hook; upper surface with a blade-like projection which is almost semicircular in outline, the subapical part slightly enlarged and curved on the upper surface and with a number of long setae usually formed into two groups; seen from below, the opening is elongate oval and narrowed at either end; paramera nearly as long as penis, slightly narrowed in the distal half, with distinct apical thorn pointing towards the penis, the apical one-fourth with long and dense setae along the margin.

Female not known.

Length 6.2 mm., width 5.0 mm.

Type specimens.—*Holotype*: male; INDIA, Nilgiri Hills, (*G. F. Hampson*); in the British Museum.

Paratype: male; with the same data as the holotype; in the Zoological Survey of India No. 7969/H4. An additional specimen with the same data but without abdomen, in the B. M.

Remarks:—Superficially this species resembles *E. nana* more than any other species dealt with here, but it can be distinguished from *nana* by the position of the pronotal and elytral spots, as follows: the pronotal spots not in two pairs and not situated on the transverse median line as in *nana* but in three pairs and situated at different levels. The elytral spots No. 1 situated distinctly away from the apex of scutellum in *anita*, while in *nana* the front tangent of the No. 1 spots passes through the scutellum at two-thirds its length. The apex of elytra in *anita* with a minute point formed at the place where the suture meets the apical margin; it is smooth in *nana*. In the structure of the

genitalia the two species differ considerably. The species can be distinguished easily from most other species of the genus by the ocellations round the elytral spots and the structure of the genitalia.

***Epilachna manipurensis*, sp. nov.**

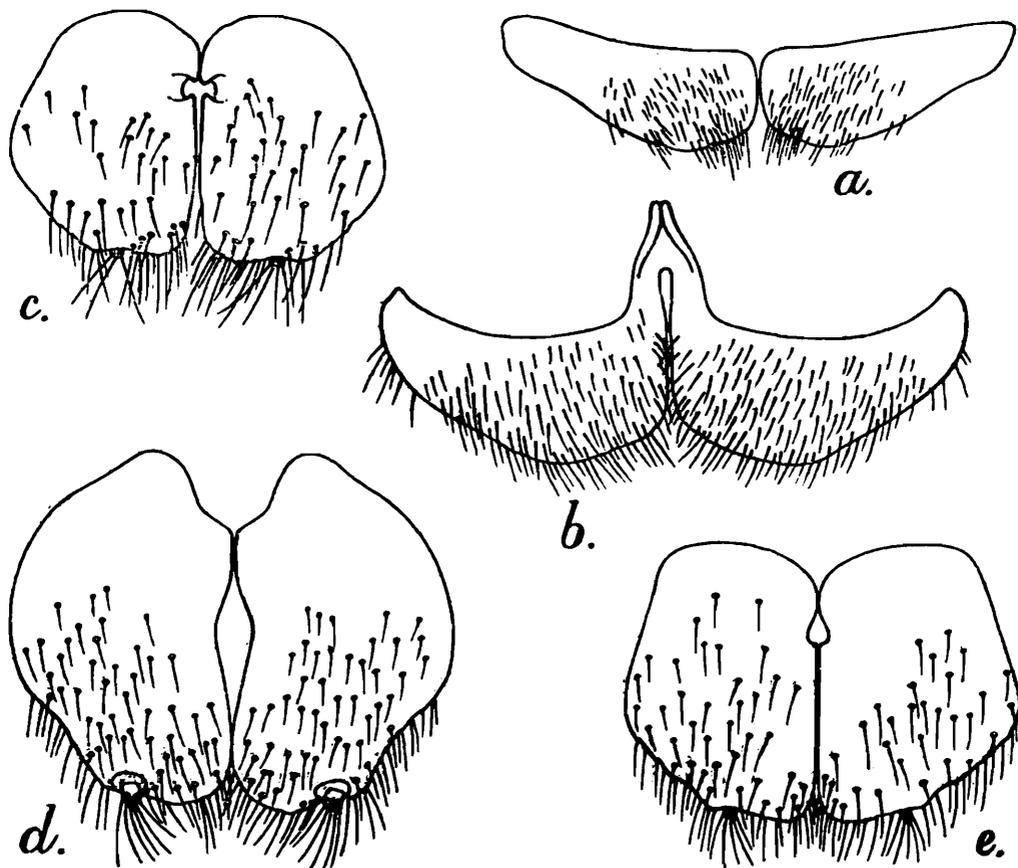
Body similar in outline to that of *E. ocellata*; pubescence also of similar colour, *i.e.*, grey except on the black elytral spots where it is also black. Head brown or slightly darker, with a moderately large, black spot between the eyes (in holotype, male) or entirely black in the front (in female); antennae and mouth-parts brown, eyes black. Pronotum rather dark brown, with a pair of large, black spots; each spot occupying lateral one-third of the pronotum except for the narrow border along the lateral and anterior margins. In another example (female) the pronotum is black except for the above-mentioned margins. Scutellum chestnut-brown. Elytra altogether with eleven black, rounded spots each of which is surrounded by light brown and moderately wide ring; the scutellar spot common to both the elytra, extended towards and almost touching their base and surrounding the scutellum on the two sides. The remaining area on the elytra piceous. The other five spots on elytron placed as in *ocellata*. The shoulder spot or spot No. 2, rounded, moderately large; spot No. 3 a little larger than spot No. 2, subrounded and slightly wider than long; spot No. 4 slightly larger than No. 3, but not touching the lateral margin as is the case in *ocellata*. Spot No. 5 equal in size to No. 3 or somewhat smaller and rounded; No. 6 also similar or a little smaller and transverse oval. Underside black except for the brown prothoracic and elytral epipleurae, the mesoepisternum and the greater part of the legs which usually have piceous femora.

Head with rather minute and fairly close punctation and moderately long and close pubescence. Pronotum more widely emarginate anteriorly than is the case in *ocellata*, anterior angles narrower, lateral margins less distinctly rounded, punctation and pubescence similar to that on the head. Scutellum very minutely and fairly closely punctate; pubescence as on the pronotum. Elytra similar in form to that of *ocellata* but with a sharp point where the suture and the apical margin meet; punctures of two kinds, the coarser ones relatively more numerous and less impressed than those in *ocellata* or any other fore-mentioned species, the other set of punctures finer than those on the pronotum; pubescence similar to that on the latter. Underside with the abdominal lines complete, semicircular, reaching about two-thirds the length of the sternite; punctation on the abdominal sternites slightly coarser than that on the pronotum, and much more so than the punctures on the metasternum; pubescence relatively short and sparse. Sixth sternite in the male with a distinct emargination in the middle, in the female completely divided longitudinally into two (Text-fig. 3, *a*). Male genitalia with the siphon very narrow, obliquely bent at one-third its length, distally rather flattened (Text-fig. 2, *d*), the siphonal capsule indistinctly marked and for the most part only a little wider than the siphonal tube, apex moderately pointed, orifice rounded, situated a

little away from the apex. General outline of the remainder of the genitalia (Text-fig. 2, c) similar in outline to that of *anita* except that the blade on the upper surface of the penis is narrower and less strongly curved. Female with the subgenital plates (Text-fig. 3, c) similar to, though slightly smaller than those of *nana* but easily distinguishable from the latter by the shape of the emargination on the inner margin of the plate, the emargination being situated at one-fourth the length of the margin and resembling three-fourths of a circle in outline; stylus not quite so small as in *nana* but smaller than that in *ocellata*, usually with three distinctly long setae.

Length 6.5 mm.; width 5.0 mm.

Type-specimens.—*Holotype* : male ; INDIA, Assam, Manipur, (*Doherty*) in the British Museum (N. H.), London.

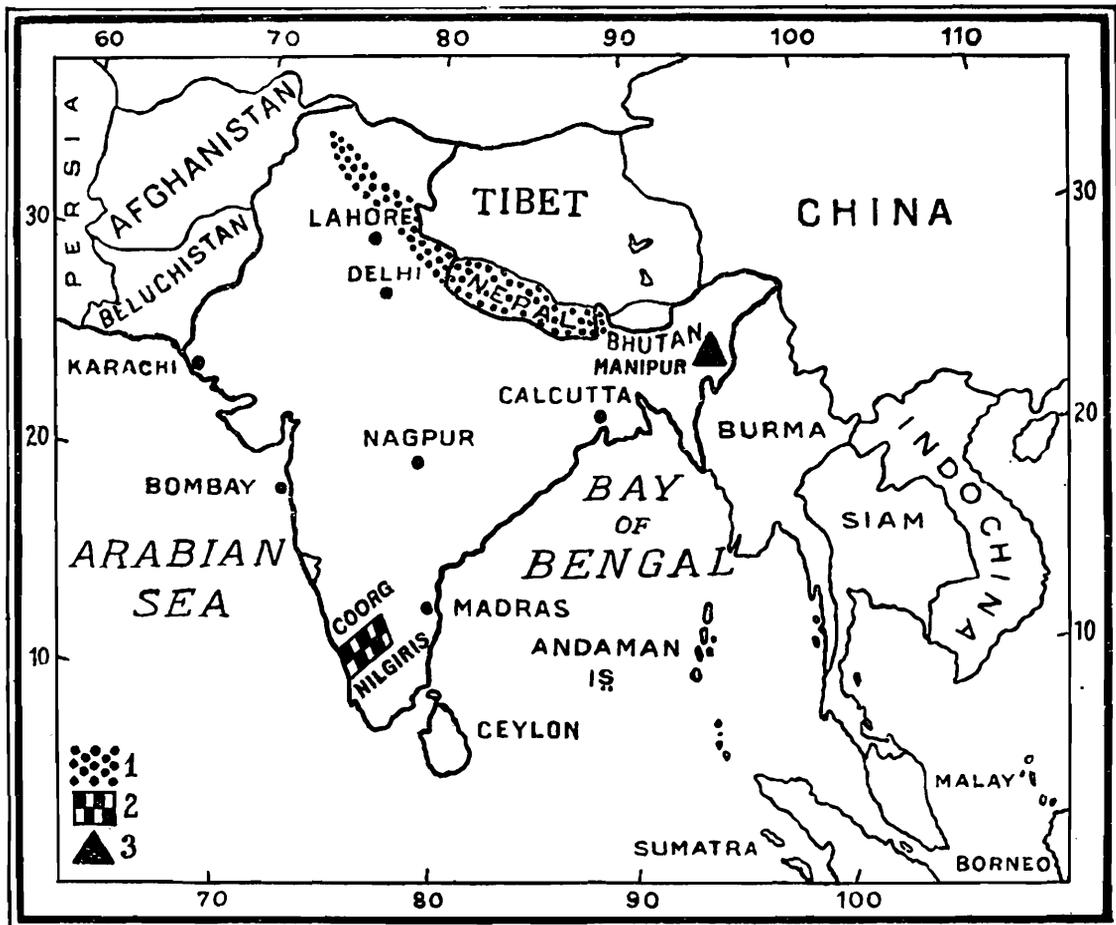


TEXT-FIG. 3.—*a.* sixth abdominal sternite of the female : *a.* *Epilachna manipurensis*, sp. nov. (X 34) ; *b.* the same of *E. ocellata* Redt. (X 34). *c.* subgenital plates (IX sternite) of *E. manipurensis* (X 54) ; *d.* the same of *E. ocellata* (X54) ; *e.* the same of *E. nana*, sp. nov. (X 54).

Allotype : female ; with the same data as the holotype, also in the B. M.

Remarks.—This species is easily distinguishable from the other species dealt with here by the position and shape of spot No. 1 on the elytra and by the shape of the siphon and the subgenital plates. It is further distinguishable from *ocellata* by the absence of the elongate median spot on the pronotum ; even when the pair of pronotal spots become enlarged to cover most of the pronotum, the absence of the median spot can be detected by the fact that the border along the anterior

margin remains brown. Spot No. 4 of the elytron does not reach the lateral margin as it does in *ocellata*. In the structure of genitalia the two species are very distinct (compare Text-fig. 2, *a* and *b*, with Text-fig. 2, *c, d, e*; Text-fig 3, *b* and *d* with Text-fig. 3, *a* and *c*). From *nana* and *anita* also it is further distinguishable by the predominantly black coloration on the underside, the position of the pronotal spots, and by the structure of the genitalia, as already stated in the description.



TEXT-FIG 4.—Map showing the distribution of : 1. *Epilachna ocellata* Redt.; 2. *E. nana*, sp. nov. and *E. anita*, sp. nov.; 3. *E. manipurensis*, sp. nov.

III.—KEY TO THE SPECIES.

The following key to the species dealt with in this paper is based on external characters only; structural differences such as those of genitalia though supporting the external characters have been avoided in the hope that it would be found more convenient to use the key without carrying out the dissections for the study of genitalia :—

1. The black scutellar spot (No. 1) away from the suture, surrounded all round by a light brown ring; not touching or forming a single spot with its opposite number on the other elytron 2.
2. The black scutellar spot (No. 1) on the elytron touching the suture and forming a single spot with its opposite number, and enclosed by a single brown ring. (Text-fig. 1, *f, g*.) *manipurensis* sp. nov.

2. Scutellum black ; spot No. 4 (near middle of external margin) of elytron produced laterally to reach the external margin ; underside mostly black or piceous (Text-fig. 1, *d, e*) *ocellata* Redt.
 Scutellum light brown ; spot No. 4 not touching the external margin ; underside mostly brown with only a pair of piceous spots on metasternum 3.
3. Pronotum with four spots arranged in a row on the transverse median line, without any spot in the middle of the said line ; apex of suture smoothly meeting the apical margin of elytra, not forming a point where the two meet (Text-fig. 1 *b. c*) *nana*, sp. nov.
 Pronotum with six spots, arranged in three pairs, never in a straight row on the transverse median line, elytra with the apex of suture forming a small point where it meets the apical margin (Text-fig. 1, *a*) *anita*, sp. nov.