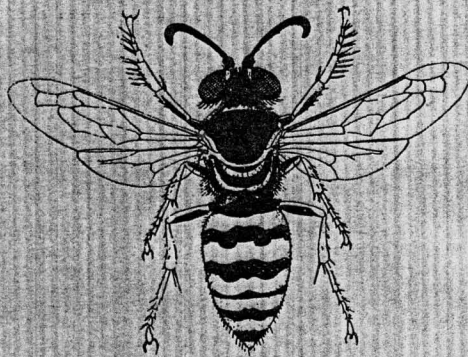


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REVISION OF THE TYPE SPECIMENS OF THREE SPECIES OF  
LIRIS DESCRIBED BY FREDERICK SMITH  
(HYMENOPTERA, SPHECIDAE)

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Through the courtesy of Mr. C. R. Vardy, Department of Entomology, British Museum (Natural History), I could reexamine the type series of the specimens of Larrada subtessellata, L. exilipes and L. laboriosa, all described by Frederick Smith and the first two have the taxonomic problem as discussed in the preceding No. of this publication. I express here my hearty thanks to Mr. Vardy for his kind help repeatedly given for my study.

I. Larrada subtessellata Smith, 1856

Larrada subtessellata Smith, Cat. Hym. Brit. Mus., IV: 277, 1856 (♀, India, Sumatra and Java).

Liris (Leptolarra) subtessellatus and docilis: Tsuneki, SPJHA, 24: 18-24, 1983.

The aim of the present revision is to confirm whether the holotype specimen of Larrada subtessellata is really Liris (Leptolarra) subtessellatus sens. Tsuneki, 1983 in which the male has the slender paramere of the genitalia, or it is in reality Liris (Leptolarra) docilis sens. Tsuneki, 1983, the male of which has the robust paramere, because the study of the abundant Philippine material has brought to light the fact that both species above mentioned included within two colour forms regarding the hind femora, namely red-form and the black-form, irrespective of the sex. If the holotype specimen is really the red-form of subtessellatus sens. Tsuneki, there is no need of alteration of the taxonomic notion hitherto believed concerning the two species. If, on the contrary, the specimen is in reality the red-form of docilis, the taxonomic notion of subtessellatus must be replaced with that of docilis and the hitherto believed subtessellatus becomes nameless, unless it is represented by some one of the synonymized species.

However, when the holotype is really the female as it is described originally (Smith frequently committed an error in his sexing) it is presumed that the identification of the specimen will be difficult, because in this sex the separation of the two species is not always clear-cut.

Observation.

The syntypes sent are two females! (originally three? India, Sumatra and Java), one of which has the type label.

(A) ♀. Pinned with a thick insect needle of about No. 5 and it is shortly cut off above insect and below the slit of card paper on which the insect is mounted. The head is incorrectly glued on to pro-mesonotum from which left antenna completely and right one from A9 apically lost, and left fore leg from femur apically and right fore leg completely lacking. Five labels, from the top: (1) Red-margined 7 mm round type label, (2) minute slit, "S R" handwritten, (3) 6 mm round pale blue card paper, with Sumatra, handwritten in 2 lines with black ink, (4) name label, subtessellata Type Sm handwritten in 2 lines, (5) Museum label, 12x10 mm, B. M. TYPE Hym (pressed in 2 lines and 21, 182 (handwritten)).

A large specimen, it will reach about 16 mm when the gaster is stretched, wings yellowish pale brown, hind femur bright yellowish red. Median lobe of clypeus with apical margin rounded out and minutely, deeply and roundly incised in middle, bevel distinct, scattered very sparsely with very fine points (almost impunctate), disc medianly bluntly raised. Measurements: HW, IODv, A3=100, 17, 18. IODv: IODc=10:28. CML: CLL=20:7. A2, 3, 4, 5=6, 10, 9.5, 10. Rhinaria on A7-9 as far as observable. Abcissae 1, 2, 3, 4, 5 of radial vein, when A5=5, =19, 6, 8, 22, 5. Medio-anterior area of mesoscutum depressed; propodeal dorsum transversely, finely and closely striate, striae on postero-lateral areas stronger and sparser, but without lateral carinae, only 2 or 3 incomplete short longitudinal rululae observed between transverse rugae at postero-lateral areas. Pile bands are on GT1-3, silvery, pygidium densely covered with somewhat brassy hair, half erect sparse bristles pale yellow, slightly brownish.

(B) The other specimen. ♀. Similarly pinned and mounted. Head normal, but it

lacks right antenna completely and A8-12 of the left, left hind tarsus glued on to the slit of card paper on which the specimen is mounted. With 2 labels: (1) "S R" as in specimen A, (2) 6 mm round, pale blue card paper with "54 76" handwritten in 2 lines. This specimen is 12.5 mm in length.

Hind femur bright yellowish red. Clypeus similar to that of the type, but with transverse bicurved line of fine punctures across middle and medio-dorsal area of bevel somewhat closely and finely punctured. Measurements: HW, IODv, A3=100, 18, 18. IODv:IODc=10:28. CML:CLL=20:7. A2,3,4,5=6,10,10,10. Rhinaria on A7 and 8 of the left antenna as far as remained. Propodeum similar in structure and sculpture to that of A in general, dorsum without lateral carinae, posterior inclination truncate, flat, in lateral view angle between dorsal and posterior aspects about 110°-115°. Pile bands are on GT1-3, silvery, pygidial hair brassy, basal smooth area roundly produced as usual. From the specimen ovipositor is taken out and lost.

#### Discussion.

The syntype specimens are the females as they are originally described and the presumed difficulty has been actualized. The results of the two observations and the measurements gave no definite clue to identify the specimens, especially the result that the measured values of CML:CLL were intermediate between the standard values hitherto acquired of the two species was almost desperate. The surface condition of the clypeal bevel, medial elevation of the clypeal disc, value of IODv:IODc and the distribution of the antennal rhinaria that are of considerable use to separate the two species in the Formosan population are now almost valueless, because these can not be applicable to the Philippine specimens. The extreme case of distribution of the antennal rhinaria is certainly useful, but here in both specimens the distribution is the case common to both the species. Only the body size of the possible holotype-(A)-specimen suggests that it may be a led-legged docilis, because, as far as examined by me, only docilis attains to such a large size, but this is not always conclusive, as the body size is considerably variable according to the environmental conditions after birth.

At this undeterminable state of affairs my study of a series of the New Guinean specimens of the believed subtessellatus-docilis complex has furnished me a reliable basis for the identification of the syntypes of Larrada subtessellata above mentioned. They consisted of 3 ♀ 9 ♂ specimens including 1 ♂ of the black-form. From the 5 males including 2 doubtful ones that have the fore femur not so strongly excavated beneath as usual the genitalia were taken out and examined. The organs were all docilis-type and it became clear that all the males were believed docilis sens. Tsuneki, 1983a and most probably the females were the same also, because they were collected from the same locality with the males. These females are, according to the observations and measurements, very similar to the syntypes of subtessellata in the measured values (especially of CML:CLL) as well as other distinctions (cf. Table 1, p. 12).

The results gave me a powerful support, besides the size of the possible holotype, to determine that the syntypes of Larrada subtessellata are the females of hitherto believed docilis sens. Tsuneki, having the red hind femora.

Such being the case it becomes necessary to alter the taxonomic notion of Liris subtessellatus (Smith) and L. docilis (Smith). Namely, hereafter subtessellatus must mean the species that has hitherto been known as docilis, the male of which has the robust paramere of genitalia, including the red- and black-forms as to the hind femora; while the species that has hitherto been known as subtessellatus, the male of which has the slender paramere of the genitalia, including also the red- and black-forms, has become nameless, at least for the time being. As to the name of the latter species mention will be made after the reexamination of the holotype specimen of Larrada exilipes Smith, ♂, which has been synonymized with subtessellata Smith, ♀, because if this species is the one that has been called subtessellatus up to now, the name, exilipes comes to revive as its name.

#### II. Larrada exilipes Smith, 1856

Larrada exilipes Smith, Cat. Hym. Brit. Mus., IV: 278, 1856 (♂, northern India, remarked by Smith himself that this is probably the male of L. subtessellata).

The specimens sent are two males, one of which is commented by Mr. Vardy as possible syntype.

(A) The possible holotype, ♂. Pinned with 25 mm business pin. From the specimen the head, left hind leg except coxa and trochanter and right hind leg from T2 apically lost. With two labels: (1) Purple blue name label, 7x17 mm, "exilipes Smith (Ind)", handwritten in 2 lines. (2) A slit of paper with "Smith coll. pres. by Mrs. Farren W. 99-303" pressed in 4 lines.

Hind femur red. Fore femur markedly excavated beneath; ratio of length above, width in posterior view at base, basal swelling, medial excavated area, apical swelling and at apex =100,18,22,18,24 and 10. Sculpture on propodeal dorsum similar to that of hitherto believed docilis ♀ in pattern, but much coarser and stronger as usual, with incomplete but distinct lateral carinae. Thorax complex + gaster = 6 mm in length.

Although the head is lost from the specimen, judging from the character of the rest of the body and appendages, there is little doubt that it is a red-legged male of hitherto believed docilis (now has changed to subtessellatus), that is to say, L. exilipes Smith is a complete synonym of L. subtessellata Smith.

(B) The other possible syntype of exilipes, ♂. Pinned specimen and mounted on a slit of card paper, with 2 labels: (1) 6 mm round pale blue label, with "48, 132" (?) handwritten in 2 lines, (2) a slit of white paper, on the back with "exilipes" handwritten with black ink. Left fore T2-5 and left hind T1-5 are lost, otherwise complete, with wings laterally well expanded.

8 mm in length, hind femur red, fore femur only gently excavated beneath, densely covered with silky white pubescence. Measurements: HW, IODv, A3=100,23,12. IODv: IODc=10:23. CML:CLL=20:17. A2,3,4,5=8,10,11,11. Placoids on A4-13. Abcissae of radial vein are in the following length increasing order: 3,5,2,1=4. Clypeus with apical margin of median lobe rounded out and without median incision, lateral angles are fairly acute (about 120°), pointed, bevel indistinct, roundly inclined anteriorly, disc without medial carina. Propodeal dorsum with lateral carinae, from postero-lateral areas posteriorly well defined, but anteriorly weaker. Pile bands on gaster on GT 1-3, silvery, epipygium flat, with short lateral carinae at apical part only.

This specimen is, judging from the structure of the fore femur, considered to be close to subtessellatus in the old sense, having the slender paramere of genitalia in the male, but judging from the ratio of CML:CLL it seems to belong to the red-form of docilis in the old sense, having the robust paramere in the male, because in the former CML:CLL=20:12-14 (♂), while in the latter the ratio =20:16-19. Moreover, it has been clarified that the determination of the two species by the form of the fore femur can not always be applicable to the southern populations, except the deeply excavated case, because in the New Guinean specimens that have the robust paramere the fore femur is frequently not or only gently excavated (Table 1, p.12), while the ratio of CML:CLL is always well applicable. Certainly in these specimens the various measured values are closely similar to those of the present specimen. To me it seems highly probable, therefore, that this specimen is also newly defined subtessellatus.

Because of that the syntypes of Larrada exilipes Smith are confirmed to be only the different sex of Larrada subtessellata Smith newly defined (now Liris (Leptolarra) subtessellatus (Smith)), the name, exilipes can not be applied to the species that has now become nameless.

On the name of the species hitherto known as subtessellatus

Two other names have been used to show a species of Leptolarra that has the red hind femora, namely insularis Cameron, 1913 and luzonensis Rohwer, 1919, the latter including the black-legged form also (both are now synonymized with subtessellatus in the general sense). We must examine the original descriptions of these as to whether they show the specific characters of the species concerned here or not.

Notogonia insularis Cameron, 1913 (Bijd. Nat. Art. Mag., Amsterdam, 19: 81) is described with a male specimen from Is. Waigieu (Waigiou or Waigio) lying near Vogel Kopf of New Guinea. In the description stress is placed on the wing venation — in those days Cameron eagerly describes the relative length of abscissae of radius as if it were the most important character of the species, without knowing the considerable variation of the character within a species — and, except "hind femora red to near apex", nothing is given about the characters that enable us to identify it with either of the two species concerned here. I do not reexamine the specimen, but judging by the fact that the New Guinean population includes solely the docilis-type (both red- and black-forms) it seems highly probable that the Cameron's specimen belongs to the species that bears the robust paramere of the genitalia.

At any rate at the present state of our knowledge the name, insularis, can not be applied to the species having the slenderer paramere of genitalia in the male.

As to Notogonidea luzonensis Rohwer, 1919 (Bull. Exp. Sta. H.S.P.A., Ent. Ser., 14: 9) the specimens treated are the females, moreover, including both the red- and black-forms. The description can be applied to both of the species concerned here and if the holotype is reexamined it seems uncertain whether or not it is surely identified with one of the problematical species. It should be interpreted that luzonensis indicates the complex of the two species concerned here. It seems better, therefore, to lay aside such an obscure name and create a new one to show distinctly the species that has the slenderer paramere of the genitalia and that is called subtessellatus erroneously in No. 24 of SPJHA (1983):

Liris (Leptolarra) difficilis sp. nov.

Liris (Leptolarra) subtessellatus: Tsuneki, SPJHA, 24: 18, 1983 (nec subtessellatus Smith, 1856, sens. nov.).

Holotype: ♂, Formosa, Yangminshan, 3. VII. 1966, K. Tsuneki (Coll. Tsuneki).

Paratypes: 10 ♀ 10 ♂, Formosa: Puli, Chuchi, Pempuchi, Iiyuchih, Tsukeng, Taitung and Hengchun, 3.VII. - 26.VIII.1966, K. Tsuneki (Coll. Tsuneki).

In the following the names, forms and their distribution hitherto known will be rearranged:

1. Liris (Leptolarra) subtessellatus (Smith, 1856), red-legged form.

Paramere of the male genitalia robust, fore femur frequently strongly excavated beneath (♂), median lobe of clypeus comparatively narrower (♀♂), hind femur red, often narrowly so (♀♂).

Distribution: Sumatra, India, South Pacific Islands, New Guinea, Philippines and possibly Java, S. E. Asia, South China, Sunda Islands, Borneo and Celebes.

2. Liris (Leptolarra) subtessellatus (Smith, 1856), black-legged form or forma docilis (Smith, 1973).

Similar in character to the red-legged form, except that hind femur is black.

Distribution: Bismarck Archipelago, New Guinea, Hawaii (introduced), Philippines, Formosa, Japan and Korea.

3. Liris (Leptolarra) difficilis Tsuneki, 1983, red-legged form.

Paramere of the male genitalia slender, fore femur not strongly excavated beneath (♂), median lobe of clypeus comparatively broader (♀♂), hind femur red, often narrowly so (♀♂).

Distribution: Philippines and Formosa, but possibly in the southern regions also.

4. Liris (Leptolarra) difficilis Tsuneki, 1983, black-legged form.

Similar in character to the red-legged form, except that hind femur is black.

Distribution: Philippines.

Remarks. In regard to the distribution the following facts are surely confirmed and seem merit of special mention:

1. In Japan and Korea subtessellatus forma docilis alone occurs.
2. In Formosa both species occur, but as to subtessellatus the black-legged form or forma docilis alone and as to difficilis the red-legged form alone occurs.
3. In the Philippines subtessellatus and difficilis with each two forms, namely all the forms occur.
4. In New Guinea subtessellatus including the two forms has been known, but difficilis has not as yet been discovered.

As to the southern regions the red-legged form is sometimes recorded, but always as a complex. Future identification with either of the two species above mentioned is necessary.

III. Larrada laboriosa Smith, 1856

Larrada laboriosa Smith, Cat. Hym. Brit. Mus., IV: 278, 1856 (♀, Philippines).  
Notogonidea laboriosa: Williams, Bull. Exp. Sta. H.S.P.A., Ent. Ser., 19: 73, 1928  
(♀ ♂, Philippines and Formosa) (with synonyms).  
Liris (Leptolarra) laboriosa: Tsuneki, SPJHA, 24: 14, 1983 (list of references).

As mentioned on p. 14-15 of SPJHA, No. 24, it seemed necessary to confirm the characters of the type of this species. So I borrowed the type specimen and reexamined it in comparison with the interpretations of Williams, Bingham and myself.

The present state of the holotype specimen.

The pinned specimen is mounted on a slit of pinned card paper. From the specimen the right antenna from A9 apically lost, left hind tibia and tarsus are lacking, otherwise complete, with wings laterally extended. With 4 labels: (1) Seven mm round red-margined type label, (2) 4 mm square label, with "Phil Isla" pressed in 2 lines, (3) 16x7 mm name label, "laboriosa Type Sm" handwritten in 2 lines, (4) Museum label "B. M. TYPE HYM. (pressed in 2 lines) and "21,149" (handwritten).

The specimen is certainly a female and, as interpreted by Williams (1928) and myself (1967 and 1983a) it has the clypeus distinctly punctured almost to the margin, but the wings are not so strongly yellowish, rather slightly darkened throughout, with only a slight yellowish tinge (in the original description "smoky hyaline, the nervures black") and the pile bands on gaster are on GT 1-3 and not on GT4 (but this is possibly rubbed off), silvery in colour, the appressed hair and the sparse erect hair on pygidial area dusky brown, in oblique light slightly yellowish. HW, IODv, A3=100, 17, 18. Antennal rhinaria on A6-10 as given by me, small and oval. Mesoscutum and scutellum delicately punctured as in subtessellatus or in difficilis. Propodeal dorsum finely transversely striate, striae on lateral verges to sides somewhat strong, raised into short carinae and mixed incompletely with some longitudinal weak rugulae from middle posteriorly (very indistinct). Length 11.5 mm. Other characters as given by me in 1967 and 1983a.

Remarks. In the Philippine specimen the pile bands on gaster are always on GT 1-4 as explained by Williams and myself. Bingham also writes that "the apical margins of segments 1-4 with broad slightly pruinose bands", but he added "these bands boldly arched anteriorly, almost subtriangular". In the Philippine specimens, as usual in this group, the bands are laterally strong and distinct and medianly weak and indistinct. As to the surface condition of mesoscutum and scutellum the original description gives "mesothorax and scutellum shining, very delicately punctured", while in the book of Bingham (1897, p. 204) "scutellum impunctate, polished and shining". This is quite strange.