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**NOTES ON ORIENTAL VESPINAE,  
INCLUDING SOME SPECIES FROM CHINA AND JAPAN  
(HYMENOPTERA, VESPIDAE)**

by

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Since the publication of my revision of the Vespinae of the Indo-Malayan and Papuan areas (1957), I have had the opportunity to study a considerable amount of additional material of this subfamily. Part of this material originated from the areas treated in my previous paper, and in so far as the following notes refer to these specimens, they may be regarded as a first supplement to that revision.

The present paper, however, also contains some information on the Vespinae occurring in India, China, and Japan. At first I had hoped to round off my studies of the Vespinae by preparing a more or less complete revision of the *Vespa* species of the Asiatic continent, but so far it has proved impossible to accumulate sufficient material for this purpose. The males of some species are either very poorly represented in collections or entirely unknown, and the problem of the geographic variation of several species appears to be much more complicated in the continental fauna than in that of the insular areas. For these reasons I have incorporated in this paper my notes on various continental species and subspecies, hoping that they will contribute to the further study of this interesting group. These notes should be regarded as supplemental to the monograph of du Buysson (1904-05), or, in the case of *Vespa affinis*, *tropica*, and *analis*, to the studies of these species by Bequaert (1936, 1939); I have therefore not repeated the literature references which may be found in these papers.

Here follows a list of the collections studied, together with the abbreviations used in the text.

BM = British Museum (Natural History), London. — Only a small part of the Oriental Vespinae of this Museum could be examined.

IRSNB = Institut Royal des Sciences Naturelles, Bruxelles. — Several Oriental Vespinae have been received for study.

LEW = Laboratorium voor Entomologie, Landbouwhogeschool, Wageningen. — Contains the Hymenoptera collected by Prof. W. Roepke in Java and in the Moluccas, and some specimens collected by H. Lucht in East Java.

MC = Zoological Survey of India (Indian Museum), Calcutta. — A small but interesting collection was received for study in 1956.

MCG = Museo Civico di Storia Naturale, Genoa. — The Oriental Vespinae of this Museum were examined during a stay in Italy in Oct.-Nov. 1957, when a stipendium of the Governments of Italy and the Netherlands enabled me to study some collections of Hymenoptera preserved in that country. The Museum at Genoa is of considerable importance for the study of the Oriental fauna; it contains extensive collections of Hymenoptera, made by various Italian naturalists in the last decades of the nineteenth century. The well known botanist O. Beccari collected in various parts of the Indo-Malayan Archipelago in 1865 and following years; L. Fea spent some years collecting in Burma and Tenasserim (1885-89; see for details: R. Gestro, *Leonardo Fea ed i suoi viaggi*, Ann. Mus. Civ. Stor. Nat. Genova, vol. 41, 1904, pp. 95-152); E. Modigliani visited Nias in 1886, the Batak area in North Sumatra in 1890-91 and Enggano Island in 1891; the last of the series is L. Loria, who collected mainly in the coastal area of South East New Guinea (1890-6). Furthermore this Museum contains the Gribodo collection, which is very rich in Oriental Hymenoptera, but unfortunately there are neither dates nor names of collectors on the labels of this entomologist. I suspect that much of Gribodo's material from the Indo-Malayan Archipelago was originally collected by the well known lepidopterist H. Fruhstorfer.

ML = Rijksmuseum van Natuurlijke Historie, Leiden. — This Museum recently received some Vespinae from the province of Fukien, East China, from Prof. Ching Tsao Maa, Taiwan Agricultural Research Institute, Formosa, and some Japanese material from Prof. S. F. Sakagami, Dept. of Zoology, Hokkaido University, Sapporo, Japan.

MP = Muséum National d'Histoire Naturelle, Paris. — After having studied the rich collection of Oriental Vespinae of this Museum in Paris in 1956, I received some specimens for a more detailed study in the course of 1957.

MT = Museo di Zoologia della Università di Torino (Turin). — The most important collection of Hymenoptera in this Museum is that of the Marquis de Spinola, particularly because it contains the types of several

species described by Lepeletier, de Saussure, and by Spinola himself. I was kindly allowed to study the Vespidae of this collection during my stay in Italy in the autumn of 1957. Some of the species in this collection have old manuscript names; in order to avoid confusion, I have not cited these names, but I have indicated their presence in the collection by adding "[MS name]" to my notes.

MZB = Museum Zoologicum, Bogor, Indonesia. — Mr. A. M. R. Wegner sent us some material from various localities in East Borneo, collected in Aug.-Nov. 1956.

NRS = Naturhistoriska Riksmuseet, Stockholm. — Dr. R. Malaise sent me the Vespidae collected by him during his travels in Burma in 1934 (see R. Malaise, Tenthredinoidea of South-Eastern Asia, Opuscula Entomologica, Suppl. IV, 1945, sketch map on p. 3).

OUM = Oxford University Museum, Oxford. — Contains most of the Hymenoptera collected by A. R. Wallace in the Indo-Malayan Archipelago and described by F. Smith in a series of papers in the Journal of the Linnean Society, vols. 2 — 8 (1858-1865).

ZSM = Zoologische Sammlung des Bayerischen Staates, München. — The Oriental Vespinae were kindly sent to me for study by Dr. Fr. Kühn.

I wish to express my sincere thanks to the authorities of these museums for their kind cooperation.

The present paper deals exclusively with the genera *Provespa* and *Vespa*; the Asiatic representatives of *Vespula* are being studied by Dr. I. H. H. Yarrow, British Museum (Natural History). In the following pages the species are arranged in alphabetical order, but the order in which the subspecies of each species are listed is determined by their geographic distribution, generally going from north-west to south-east.

It is of interest to note that the additional information on the species and subspecies discussed in my previous paper does not invalidate the distribution maps published at that time, practically all the new localities lying within the limits shown on these maps. The absence of *V. analis* in North and Central Sumatra, and in Borneo, is confirmed by the new data. The most important discovery is perhaps the capture of some workers and one male of *Vespa affinis indosinensis* Pérez in Kasemen, North of Serang, in West Java, for up to the present this widespread species had never been found in this island. It looks as if this species has very recently migrated from Sumatra, or from the islands in the Sunda Straits, into West Java, but we must await further captures before we can have certainty on this point. If the species appears in the environs of Djakarta and Bogor in the near future, this may be re-

garded as a proof that it is indeed filling up the gap in its area of distribution, for in these localities it can hardly have been overlooked.

The following species and subspecies were not discussed in my paper of 1957:

<i>Vespa affinis affinis</i> (L.)	<i>Vespa orientalis</i> L.
— — <i>continentalis</i> Bequaert	— <i>tropica haematodes</i> Bequaert
— <i>analis insularis</i> Dalla Torre	— — <i>ducalis</i> Smith
— — <i>parallela</i> André	— — <i>pulchra</i> Buysson
— <i>binghami</i> Buysson	— — <i>pseudosoror</i> , n.subsp.
— <i>bicolor citriventris</i> Buysson	— — <i>eulemoides</i> Buysson
— <i>crabro oberthuri</i> Buysson	— <i>variabilis variabilis</i> Buysson
— <i>dybowskii</i> André	— — <i>fumida</i> , n.subsp.
— <i>mandarinia latilineata</i>	— <i>velutina pruthii</i> , n.subsp.
Cameron	— — <i>auraria</i> Smith
— — <i>mandarinia</i> Smith	— <i>vivax</i> Smith
— — <i>nobilis</i> Sonan	— <i>walkeri</i> Buysson
— <i>mongolica</i> André	

A new subgenus has been erected for the aberrant *Vespa binghami* Buysson.

#### Genus **Provespa** Ashmead

##### **Provespa anomala** (Saussure)

This species was originally described from "L'île de Java. (Collection de M. le marquis Spinola, Musée de Londres, etc.)". The Spinola collection contains a worker, with label: "Vespa anomala, ♀, De Sauss. Polistes [MS name] m. olim, Java, coll. Serville". This is almost certainly a syntype, but it is in very poor condition (most of the head, and the gastral segments 3-6, are missing), and if another syntype can be found in the British Museum, it would probably be preferable to select that as the lectotype. The anterior margin of the clypeus of the specimen in the Torino Museum is intact and allows a certain identification.

Tenasserim: 5 ♀ Malewoon, July-Aug. 1887, L. Fea (MCG, 1 ♀ ML); 1 ♀ Thagatà, April 1887, L. Fea (with label: "Anche questo Vespide notturno è comunissimo" (MCG).

Malaya: 1 ♂ "Is. Karimon, Stretto di Malacca, 1913, G. Gaggino" (MCG); 1 ♀ Singapore (OUM).

Borneo: 1 ♀ "Borneo", leg. Doria (MT); 1 ♀ "Borneo", coll. Gribodo (MCG); 1 ♀ 1 ♂ Sandakan, leg. Baker, coll. Gribodo (MCG); 1 ♀ Sarawak,

1865-66, leg. G. Doria (MCG). Sarawak: 2 ♀ "Sar.", leg. Wallace (OUM); foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 1 ♀ 1 Aug. 1932, 13 ♀ 29 Aug. 1932 (3 from light trap 4, 10 from trap 5), 7 ♀ 30 Aug. 1932 (all from trap 2), 14 ♀ 31 Aug. 1932 (9 from trap 2, 1 from trap 3, 4 from trap 4), 11 ♀ 1 Sept. 1932 (5 from trap 2, 2 from trap 3, 4 from trap 5), 1 ♀ 2 Sept. 1932 (trap 5), 3 ♀ 4 Sept. 1932 (traps 3-5), 1 ♂ 11 Sept. 1932 (trap 3), 1 ♀ 12 Sept. 1932; R. Kapah Trib. of R. Tinjar, 1 ♀ 4 Oct. 1932, 1 ♂ 3 Nov. 1932; Mt. Dulit, 4000', moss forest, 4 ♀ 19-23 Oct. 1932; all collected by the Oxford Univ. Exp., B. M. Hobby and A. W. Moore (BM, duplicates in ML). 1 ♀ Bandjermasin, coll. Gribodo (MCG). 1 ♀, many ♀ ♀, 2 ♂ ♂ Tabang, Bengen River, Aug. 1956, A. M. R. Wegner (MZB, ML).

**Sumatra:** 12 ♀ "Sumatra", coll. Gribodo (MCG); 1 ♀ "Sumatra", from Ritsema, coll. Gribodo (MCG); 1 ♀ Mt. Singhalang, July 1878, O. Beccari (MCG); 1 ♀ Pagaranpisang, Oct. 1890-March 1891, and 1 ♀ Si-Rambé, Dec. 1890-March 1891, E. Modigliani (MCG); 1 ♀ "Pea Ragia", Oct. 1890, E. Modigliani (MCG), 1 ♀ Sukaranda, Jan. 1894, Dohrn (MCG); 1 ♀ Padang, 1890, E. Modigliani (MCG); 1 ♀ Medan, leg. von Hayek (ZSM); 6 ♀ Labuan Bilik, leg. Mr. Dorsinfang (IRSNB).

**Batu Islands:** 1 ♂ Batu, 1896-97, H. Raap (MCG).

**Provespa barthelemyi** (Buysson)

**Burma:** 1 ♀ Rangoon, May 1887, L. Fea (MCG); 1 ♀ Teinzo, May 1886, L. Fea (MCG); 29 ♀ 1 ♂ Bhamò, April-Oct. 1886 (incl. 2 paratypes), L. Fea (MCG); 1 ♀ Palon, Pegu, Aug.-Sept. 1887, L. Fea (MCG); 1 ♀ Chan Yoma, coll. Gribodo (MCG); 1 ♀ Minhla, 1882, leg. Comotto, coll. Gribodo (MCG); N. E. Burma, 5 ♀ Kambaiti, 7000 ft., 15 April-23 June 1934, R. Malaise (NRS, 1 ♀ ML); 2 ♂ Washaung, 20 km east of Myitkyina, 14 July 1934, R. Malaise (NRS, ML).

**Tenasserim:** 2 ♀ Kawkareet, Jan.-Febr. 1887, L. Fea (MCG); 1 ♀ Thagatà, March 1887, L. Fea (*Vespa barthelemyi* det. Buysson, paratype; MCG).

**Thailand:** 1 ♀ Keng Phan Dao, 7-8 Dec. 1957, leg. L. D. Brongersma (ML).

There is one worker with a label "Perak, D. Gribodo" in the Mantero collection (MCG), but I suspect that this specimen is incorrectly labelled, the more so since I did not see any *P. barthelemyi* from this locality in Gribodo's collection.

One of Fea's specimens from Bhamò (Aug. 1886) bears a note: "Non ho mai osservato questo Vespino durante il giorno, *tutti* gli esempl. raccolti vennero catturati al lume della lampada".

**Provespa nocturna** van der Vecht

Sumatra: 4 ♀ Pagaranpisang ("Pangheran Pisang"), Oct. 1890 and March 1891, E. Modigliani (MCG); 1 ♂ Mt. Kerintji, Aro Estate, March 1954, A. H. G. Alston (BM).

Borneo: Sarawak, 13 ♀ Mt. Dulit, moss forest, 4000 ft., 16-22 Oct. 1932, at light, 1 ♀ R. Koyan, 2500 ft., 19 Oct. 1932, light trap in primary forest, all leg. Oxf. Univ. Exp. (BM).

Genus **Vespa** Linné**Nyctovespa**, new subgenus

In the preliminary arrangement of the species of *Vespa*, published by Bequaert in 1930, *Vespa binghami* is the only member of a group which is distinguished by the large ocelli. Bequaert had seen only a female of this species, and suspected that it would prove to be a nocturnal or crepuscular wasp. A collection of Indian Vespidae, kindly sent to me for study by Dr. A. P. Kapur, Zoological Survey of India, Calcutta, contains a worker of *V. binghami*, collected "at light", thus confirming that this is a species with nocturnal habits; furthermore it contains a specimen of the hitherto unknown male, which proves to be rather different from the males of the other species of *Vespa*. It seems desirable to indicate the isolated position of this species in the genus *Vespa* by placing it in a separate subgenus.

Characters: Ocelli large, the posterior ones a little nearer to the eyes than to each other (♀ and ♀), or about equally distant (♂). Antennae of male without tyloides, but segments 3-11 with a few scattered short hairs on their inner side; segments 12 and 13 on inner side with a dark and slightly shiny area, which is bordered on each side by a fine longitudinal groove; segment 13 longer than 12, curved and somewhat flattened. Apical gastral segments without incisions or emarginations, the last segment almost evenly rounded posteriorly.

Type species: *Vespa binghami* Buysson.

**Vespa binghami** Buysson

China: Yunnan, 1 ♀ Tsékou, R. P. Dubernard, 1895, from R. Oberthür, 1901 (MP).

Burma: 1 ♀ Taungoo Hills, March 1898, leg. Bingham ("type", MP, herewith designated as lectotype). (Du Buysson wrote "Tenasserim", but this seems incorrect).

West Bengal: Darjiling Distr., 1 ♀ 1 ♂ 7000-8000 ft., Nov. 1941,

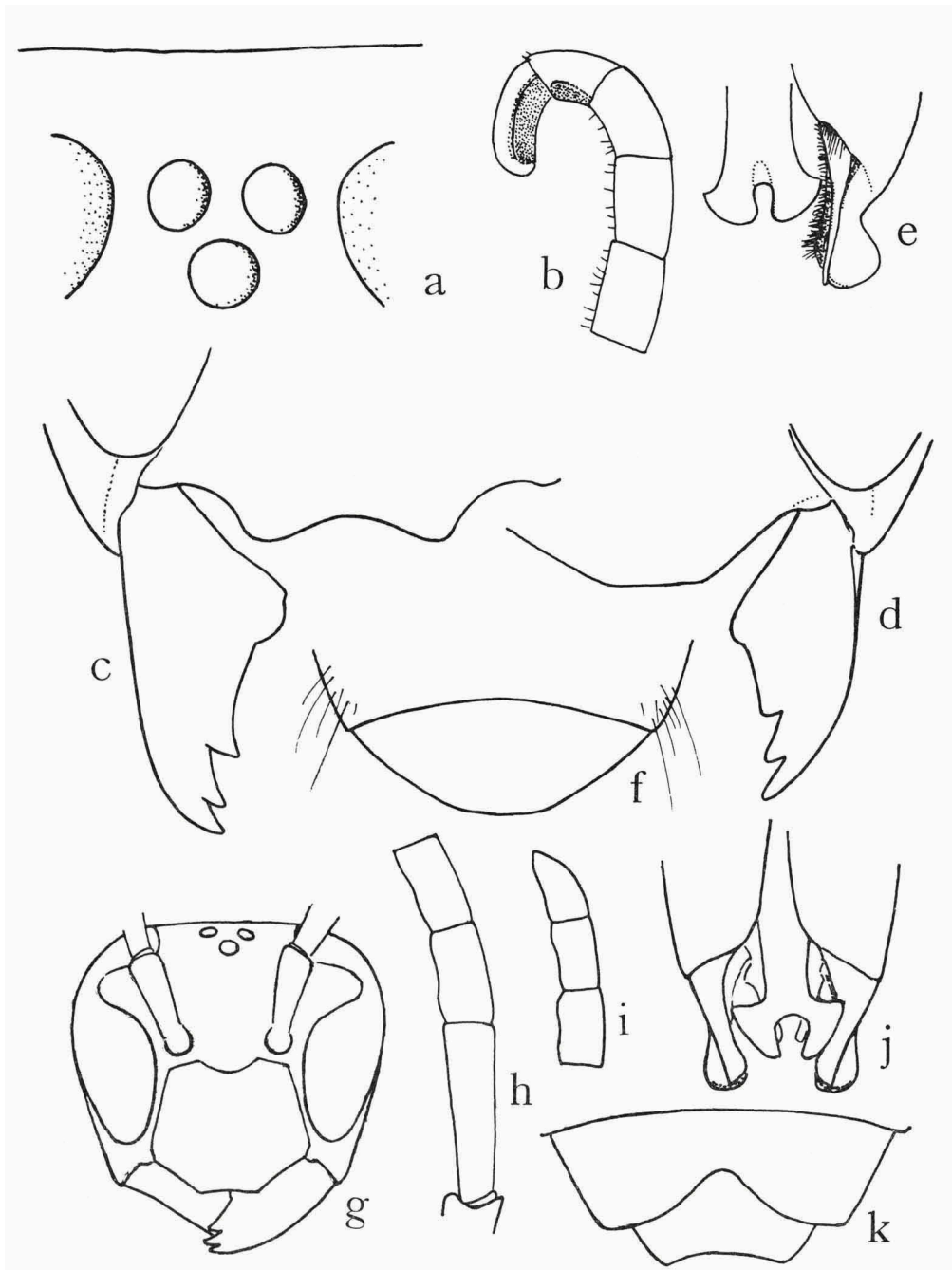


Fig. 1. a-f: *Vespa (Nyctovespa) binghami* Buysson. a: ocelli of ♀. b: antennal segments 9-13 of ♂. c: anterior part of clypeus, and right mandible of ♀. d: anterior part of clypeus, and left mandible of ♂. e: part of genitalia of ♂. f: apical gastral sternites of ♂. — g-k: *Vespa walkeri* Buysson, ♂. g: anterior view of head. h and i: antennal segments 2-5 and 11-13. j: part of genitalia. k: apical gastral sternites.

H. A. Hafiz (ML, MC, resp.); 1 ♀ Jospokhri, 7400 ft., Oct. 1941, at light, H. A. Hafiz (MC).

Tenasserim: 1 ♀ Mekane, 90 km East of Moulmein, 200 m, 2-8 Nov. 1934, R. Malaise (NRS).

Some structural details of this species are shown in fig. 1. In the female and worker the anterior half of the clypeus is densely punctate; the punctures are rather coarse, but not very deep and not well defined; the punctures on the basal half of the clypeus are sparser, finer, and more superficial. Lateral keels of inter-antennal shield rounded. Temples thick, as seen in profile wider than the eyes, distinctly visible in frontal view.

Length (h. + th. + t. 1 + 2): ♀ 25 mm, ♀ 20 mm, ♂ 21 mm.

#### Subgenus **Vespa** Linné

Ocelli small, the posterior ones much farther from the eyes than from each other. Antennae of male (so far known) with tyloides. As a rule one or more apical gastral segments of the male incised or emarginate in the middle.

Type species: *Vespa crabro* Linné.

#### **Vespa affinis affinis** (Linné)

China: 1 ♀ Shanghai, coll. Gribodo (MCG); 5 ♀ 7 ♂ Foochow, M. S. Yang (BM); 2 ♀ "Vespa affinis Fab ♀, Chine"; round labels "6685" and "6686", coll. Spinola (MT); Prov. Fukien: 1 ♀ Cheng-Ki, Changting Hsien, 27 April 1941, 4 ♀ Chih-Shih (n. Bohea Hills), Chungan Hsien, 7 Oct. 1939, 5 ♂ Yungan, 20 Oct. 1940, 1 ♂ do., 15 Nov. 1940, all leg. Tsing Chao Maa (ML).

India: 2 ♀ Bombay, leg. Fortanier, "301-39" (MP); both specimens bear a label in du Buysson's handwriting: "*Vespa ducalis* var. *soror* Buysson, R. du Buysson det. 1903". Calcutta, 2 ♀ 2 ♂ S. Entally, 27 Nov. 1924, G. Haultain (MC). 1 ♀ Katihar, Purneah Distr., C. A. Paiva (MC); 1 ♀ Tamoy, Koyna Valley, Sata-a Distr., 2100 ft., 24-26 April 1912, F. H. Gravely (MC); 1 ♀ Rampore, Haut, West Bengal, 25-26 Febr. 1931, S. Ribeiro (MC). Calcutta, 5 ♀ environs of town, 13 Sept. 1905, Brunetti (MCG).

Burma: 1 ♀ Minhla, Comotta, 1883 (MCG); 1 ♀ S. Shan States, Inle Lake, South end, Taungdoo, 900 m, 10 Sept. 1934, R. Malaise (NRS). — In the latter specimen the head is red with a dark blotch between the antennae and at the base of the clypeus; thorax black with large reddish mark on each side of horizontal part of prothorax; gastral tergites 1 and 2 orange yellow, first tergite brownish at extreme base and with small dark spot in the middle of the horizontal part at a short distance from the posterior margin; first sternite and basal blotch on second sternite dark brown.



**Vespa affinis continentalis** Bequaert

South India: 1 ♀ Malabar, Deschamps, 1889-90, coll. Magretti (MCG); 1 ♀ South India, no. 5499/6 (MC); 6 ♀ and ♀, Shembaganur, 1929-30, R. P. Manuel (IRSNB); 2 ♀ Nilghiri, Coonoor, 1902, M. Maindron (MP); 1 ♀ Naraikkadu, 2500-3000 ft., Tinnevely Distr., March 1936, 1 ♀ Coonoor, 6000 ft., April 1937, both BM & CM Exp. (BM).

**Vespa affinis indosinensis** Pérez

Burma: 3 ♀ 1 ♂ Schwego Myo, Oct. 1885, L. Fea (MCG); two workers are typical *indosinensis*, one has the upper half of the head mainly red, the male has head and pronotum red, but interantennal shield and basal two thirds of clypeus black.

Tenasserim: 28 ♀ and ♀, Malewoon, July-Aug. 1887, L. Fea (MCG).

Indo-China: 1 ♀ Phuquoc, 28 Aug. 1924, R. V. de Salvaza (IRSNB). 1 ♀ Tonkin, Hanoi, coll. J. de Gaulle, 1919 (MP); 2 ♀ Tonkin, rég. de Hoa-Binh, A. de Cooman, 1927-8, 1 ♀ Tonkin, Poste de Dong-Dang, Madame Réville; 2 ♀ Cochinchine, Cap St. Jacques, leg. Fouquet, 1913; 1 ♀ Annam, Lién-Chiên près Tourane, 1000 m, Mme Poilane, 1923; 1 ♀ Annam, Col des Nuages près Tourane, Mme Poilane, 1923; 2 ♀ Annam, Quang-tri, M. Mau-nier, 1922 (all MP).

Siam: 4 ♀ Ronpibun, Aug. 1935, Dajak Layang Gaddi (IRSNB).

Malaya: 4 ♀ Kuala Lumpur, A. S. Corbet, Nov. 1929 (BM); 2 ♀ Perak, coll. Gribodo (MCG); 1 ♀ Penang, 600-800 m, Febr. 1889, leg. Loria and Fea (MCG); Singapore, 1 ♀ leg. G. Doria, 1 ♀ leg. Baker (MCG).

Sumatra: 3 ♀ "Sumatra", coll. Gribodo (MCG); Siboga, 4 ♀ April, 1 ♀ Oct. 1890-March 1891, E. Modigliani (MCG); 3 ♀ Benculen, April 1891, E. Modigliani (MCG). 1 ♀ Medan, 1 ♀ Padang (LEW).

Nias: 1 ♀ Mt. Sitoli, E. Modigliani (MCG); 2 ♀ 1897-8, U. Raap (MCG).

Java: Banten, West Java, 5 ♀ 1 ♂ Kasemen, 14-17 May 1957, A. M. R. Wegner (MZB, ML).

**Vespa affinis rufonigrans** van der Vecht

Celebes: 7 ♀ and ♀ "Celebes", coll. Gribodo (MCG).

Morotai: 5 ♀ and ♀ "Morty", coll. Gribodo (MCG).

**Vespa affinis nigriventris** van der Vecht

Palawan: 2 ♀ P. Princesa, leg. Baker (MCG); 1 ♂ "Palawan", coll. Gribodo (MCG).

Labuan: 1 ♀, June 1924, C. B. Kloss (BM), agrees well with the specimens from Palawan.

**Vespa affinis moluccana** van der Vecht

Ambona: 1 ♀ ex coll. Mocsary (MCG); 2 ♀, 1873 and Dec. 1874, leg. O. Beccari (MCG); 8 ♀ coll. Gribodo (MCG).

**Vespa affinis alduini** Guérin

Buru: 1 ♂ "Vespa bimaculata Guér. (alduni Coq. pl. 9), Typus, Bourou" in Guérin's handwriting (type, MCG).

**Vespa affinis archboldi** van der Vecht

New Guinea: 1 ♀ Cyclops Mts., Mt. Lina, 3500 ft., March 1936, Miss L. E. Cheesman (BM); 1 ♀ 1 ♂ "Affak" (MCG).

**Vespa affinis picea** Buysson

South New Guinea: 1 ♀ Yule Island, June 1875, L. M. d'Albertis (MCG); 1 ♂ Kapakapa, May-June 1891, L. Loria (MCG); 5 ♂ Tupuseleia, June 1892, L. Loria (MCG; a worker with label "Vespa cincta var. picea Buyss., det. Buysson, 1904" has been selected as the lectotype by me).

**Vespa affinis alticincta** van der Vecht

New Britain: 1 ♀ 1 ♂ "Bismarck Archipel", coll. Magretti (*Vespa cincta* var. *alduni* Guérin, det. du Buysson) (MCG).

**Vespa analis parallela** André

Formosa: 1 ♀ Kaushirei, 1 May 1908, H. Sauter (ZSM).

China: 1 ♀ or ♂, Foochow, 30 June 1936, M. S. Yang (BM); Prov. Fukien: 2 ♀ Chi-Li-Ch'iao, Chungan Hsien, 24 Oct. 1942, leg. Tsing Chao Maa (ML).

**Vespa analis insularis** Dalla Torre

Japan: 2 ♀ Japan, F. Ancey (*V. parallela* André, det. R. du Buysson 1904) (ML); 4 ♂ Japan, von Siebold (ML); series from Kofou (MP; 1 ♀ 1 ♂ ML); 1 ♀ Fukuoka, Kiusiu, June 1945, R. van der Veen (ML).

**Vespa analis nigrans** Buysson

West Bengal: 1 ♀ Darjiling, 16 July 1937, leg. Tsing Chao Maa (ML).

**A s s a m**: 1 ♀ "Assam", Dr. Heyne, 1891, coll. Magretti (MCG), a dark specimen: head red, thorax dark, only the pronotum with obscure rufous band; gaster very dark brown, apical margins of tergites 2-5 with narrow ferruginous bands; segment 6 brownish (?discoloured). 2 ♀ Shillong, Sept. 1903 (BM, ML). 1 ♂ "Assam", coll. Magretti (MCG).

**B u r m a**: 3 ♀ 1 ♂ Chan Yoma, coll. Gribodo (MCG); 1 ♀ 3 ♂ Carin Chè-bà, 900-1100 m, May-Dec. 1888, L. Fea (*Vespa nigrans* det. Buysson, one worker with label "Cotypus"). The Burmese specimens have the thorax more brightly coloured (brown, paler on pronotum and scutellum) than those from Assam, which appear to approach the "variety" *barboursi* Bequaert. Also the abdomen is more extensively ferruginous: the anterior face of the first gastral tergite is dark at the base only, and there are ill-defined ferruginous spots at the base of tergite 2. Specimens from Malaya, however, are more like those from Assam.

**T e n a s s e r i m**: 1 ♂ Sukli, 75 km East of Moulmein, 600 m, 27-31 Oct. 1934, R. Malaise (NRS).

#### **Vespa analis tyrannica** Smith

**S i n g a p o r e**: 2 ♀ Singapore, C. F. Baker, coll. Gribodo (MCG). The type is a female, collected by Wallace, "Sing., 55/9" (no. 18, 928, BM).

#### **Vespa analis analis** Fabricius

**B a n g k a**: 1 ♀ (without head) Aer Mesu, 25 Dec. 1937, W. Jepson (BM).

**I s l a n d s i n S u n d a S t r a i t s**: 1 ♀ Rakata, 1 ♀ Sertung (= Verlaten Eiland), 1 ♀ Penaitan, June-July 1955, all leg. A. M. R. Wegner (ML).

**W e s t J a v a**: 1 ♀ "Vespa analis Fab ♀, Java, D, Klug", coll. Spinola (MT); 2 ♀ "Vespa, Ind. or. D. Dupont" (1 ♀ without label, 1 ♀ "analis") [certainly from Java], coll. Spinola (MT). 14 ♀ and ♂, 1 ♂ Sukabumi (IRSNB). 10 ♀ and ♂ "Java" and "Buitenzorg" (Bogor) (ZSM). 1 ♀ Buitenzorg, 1877, G. B. Ferrari, do., 1 ♂ 1879 (MCG); 1 ♂ Buitenzorg, J. B. Ledru, coll. Oberthür (MCG); 6 ♀ and ♂ Java ("Giava"), 3 ♀ and ♂ Batavia, coll. Gribodo (MCG); 1 ♀ Batavia, Dec. 1907, E. Jacobson (MCG). 2 ♀ Bogor (LEW).

#### **Vespa analis tenebrosa** Buysson

**J a v a**: 1 ♂ "Java", leg. Viscount Tredegar, no. 1938-424 (BM); 2 ♀ 1 ♂ "Java", Febr. 1902 (ZSM); 1 ♀ Ngantang near Sedan, Rembang, Mrs. Neuhaus (ZSM). 1 ♀ "Java", ex coll. Ritsema, coll. Gribodo (MCG).

**B a l i**: 2 ♀ Bali, coll. Gribodo (MCG).

**Vespa basalis** Smith

A s s a m: 1 ♀ 1 ♂ Assam, from Staudinger, 1 ♀ 1 ♂ Assam, coll. Gribodo, 3 ♀ Assam, coll. Magretti (MCG). 1 ♀ Shillong, Oct. 1903 (BM).

B u r m a: 1 ♀ N. E. Burma, Sadon, 1200 m, 28 June-5 July 1937, R. Malaise (NRS); S. Shan States, 3 ♀ Taunggyi, 1500 m, 1 Aug.-22 Sept. 1934, 1 ♀ Inle Lake, South end, Taungdo, 900 m, 10 Sept. 1934, all R. Malaise (NRS); 1 ♀ Mali Hka Valley, Kachin Hills, 1500 ft., 9 Dec. 1930, F. Kingdon Ward (BM); 1 ♀ Carin, Asciiu Chebà, 1200-1300 m, Jan. 1888, L. Fea (MCG); 21 ♀ Carin Chebà, May-Dec. 1888, L. Fea (1 ♀ *V. basalis* det. Buysson) (MCG), 1 ♀ "Birma", 57/16 (BM).

T e n a s s e r i m: 1 ♀ M. Mooleyit, 1900 m, April 1887, L. Fea (MCG).

C h i n a: 1 ♀ Kouy Tchéou, Se-Tchouen, P. Cavalerie, 1913 (MP).

I n d o - C h i n a: 2 ♀ Tonkin, région de Hoa-Binh, A. de Cooman, 1927 (MP).

S u m a t r a: 1 ♀ Mt. Sibajak, 1400-1800 m, 9 June 1929, H. von Hayek (ZSM). 2 ♀ "Sumatra", coll. Gribodo (MCG); 1 ♀ Mt. Singhalang, July 1878, O. Beccari (MCG); 1 ♀ Balighe, Oct. 1890-March 1891, E. Modigliani (MCG).

**Vespa bellicosa** Saussure

This species was described from "Java (Collect. de M. le marquis Spinola et de M. Smith)", but it certainly does not occur in this island. A female in the collection Spinola (MT), standing in front of a box label: "Vespa bellicosa De Sauss. Java, coll. Serville", is herewith selected as the lectotype. It agrees completely with the present interpretation of this species. The anterior, vertical, surface of the first gastral tergite is yellow, black at base, and with dark median line, the yellow colour extends on the base of the horizontal part, where it is separated from the apical yellow band by a black band, which is widened in the middle and also at the sides, where it reaches the anterior margin; the yellow band on the second tergite covers the posterior half. Clypeus yellow, with at base a dark spot which is more than half as long as the clypeus; further yellow markings on the face: a line at the inner orbits ending slightly beyond the centre of the eye-emargination, and a mark between the antennae.

B o r n e o: 1 ♀ Bandjermasin, coll. J. Pérez (MP); 1 ♀ Sampit, 21 Jan. 1954, 1 ♀ Pemanten ("Permantan"), 27 Jan. 1954, A. H. G. Alston (BM); 1 ♀ "Borneo", coll. Gribodo (MCG); East Borneo, 1 ♀ 2 ♀ Kembang Djangut, 75 m, 25 Nov., 21 July, and 24 Nov. 1956 resp., 8 ♀ Tabang, Bengen

River, 125 m, Aug.-Nov. 1956, 1 ♀ Gunungsari, 95 m, Aug. 1956, all A. M. R. Wegner (MZB, ML).

Bengkalis I.: 1 ♀ Bengkalis, Maindron, ex MP (MCG).

**Vespa bicolor bicolor** Fabricius

China: 1 ♀ Foochow, 1935-6, M. S. Yang (BM); 3 ♀ "Vespa bicolor Fab. = V. [MS name] De G., Chine", coll. Spinola (MT); 1 ♀ "Vespa bicolor var. = V. [MS name] Hahn, Asia or., coll. Hahn", coll. Spinola (MT). Prov. Fukien: 1 ♀ Chi-hsia, Kienyang Hsien, 12 June 1942, 6 ♀ Ku-hsien-chieh, Shaowu Hsien, 16-20 Sept. 1945, 1 ♂ Chih Shih (n. Bohea Hills), Chungan Sien, 14 Dec. 1939, all leg. Tsing Chao Maa (ML).

Assam: 1 ♂ Dirang Dzang, 5-6000 ft., 5 May 1935, F. Kingdon Ward (BM).

In the male the emargination of the sixth gastral tergite is relatively wider than in *V. velutina*, with which this species appears to be closely allied.

**Vespa bicolor citriventris** Buysson

This form was described by du Buysson (1905, p. 552) as a variety of *Vespa auraria* Smith, but it agrees in all morphological details, including the pubescence of the abdomen, with *Vespa bicolor* Fabricius. The collection of

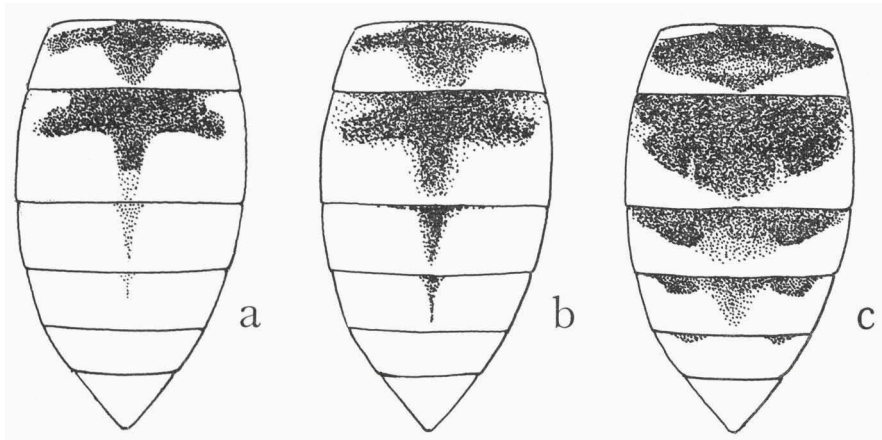


Fig. 2. *Vespa bicolor citriventris* Buysson. a and b: gastral tergites of the brightest and the darkest ♀ in the series from Kambaiti, Burma. c: ♀ from Darjiling (MP).

the Paris Museum contains a female from Sikkim, Padamtsin-Lingtou, 1901, R. Oberthür, and a worker from each of the two other localities mentioned by

du Buysson, Darjiling in West Bengal and Tsékou in Yunnan. The specimen from Sikkim is herewith selected as the lectotype.

In a series of 18 females, collected by Malaise in N. E. Burma (Kambaiti, 7000 ft., 4 April-23 June 1934, NRS and ML), the extent of the black colour on the abdomen is somewhat variable, but even the darkest specimen is less extensively marked with black than du Buysson's specimen from Darjiling (fig. 2c), which was kindly lent to me by the Paris Museum. The variation of this form requires further study; according to du Buysson all the gastral segments have the posterior margins "plus ou moins largement marginés de jaune clair", but at the time when I examined his material I omitted to make detailed notes on the extent of the dark colour, and I am therefore unable to say whether du Buysson's specimens are all darker than those from Burma. For the moment it seems advisable to record the Burmese specimens under the name *citriventris*.

The females from Burma agree with the worker from Darjiling in the following characters: Dark area on frons and vertex connected on each side with the antennal insertions by a black line. Scutellum with a broad black median line, which is widened anteriorly and posteriorly, often more or less extended along the anterior margin; postscutellum usually with a narrower median mark, which is pointed posteriorly and does not reach the apex propodeum with a black line along the posterior margin of the postscutellum and with a dark median line, these lines together forming a Y-shaped mark. Dark markings of gastral tergites variable, as shown in figs. 2a and 2b.

#### **Vespa crabro flavofasciata** Cameron

*Vespa flavo-fasciata* Cameron, 1903, Entomologist, vol. 36, p. 280, ♀ — "Nügata (Shinanogawa)", Japan (type BM).

*Vespa crabro* var. *flavo-fasciata* Bequaert, 1931, Konowia, vol. 10, p. 103, 107 (Japan).

J a p a n : 2 ♀ "Japan" (ML). 1 ♀ Kofou, L. Drouart de Lezey, from MP (ML); 1 ♀ Env. de Tokyo, 1906, J. Harmand, from MP (ML).

#### **Vespa crabro oberthuri** Buysson

C h i n a : 3 ♂ Se-Tchouen, Siao-Lou, leg. R. Oberthür (type and paratypes, MP); 2 ♀ Ta-Tsien-Lou (paratypes, MP, ML); 1 ♂ Yunnan, Tsekou, Mgr. Soulié, from R. Oberthür, 1898 (MCG).

#### **Vespa dybowskii** André

B u r m a : N. E. Burma, 2 ♀ Kambaiti, 7000 ft., 15 May and 4-8 June 1934, R. Malaise (NRS, ML).

**Vespa fervida** Smith

Celebes: 1 ♀ 2 ♂ Woloan, Manado (IRSNB); 2 ♀ Minahasa, coll. Gribodo (MCG); 2 ♀ Macassar, coll. Gribodo (MCG); 1 ♀ Kandari, April 1874, leg. O. Beccari (MCG); 1 ♀ Pic Bonthain, coll. Gribodo (MCG).

**Vespa luctuosa luctuosa** Saussure

Luzon: 1 ♀ 2 ♂ Mt. Makiling, C. F. Baker (MCG); 1 ♀ Banahao, coll. Gribodo (MCG); 1 ♂ Los Baños, Baker (MCG). From the Museum in Madrid I received for study 2 ♂ labelled "Lucban, Mazarredo" (or "Maranedo"?), which had been identified by du Buysson in 1904 as *V. luctuosa* var. *semperi* Buysson. These workers have the abdomen coloured as follows: Tergites 1-4 each with narrow apical yellow band, the second band a little narrower than the first, the third and fourth a little wider; sternite 2 with rudiments of apical band in posterior angles, sternite 3 with complete apical band which is as wide as that on the third tergite; tergites 5 and 6 and sternites 4-6 brownish, without apical bands.

Mindoro: 1 ♂ Mindoro, coll. Gribodo (MCG).

**Vespa luctuosa semperi** Buysson

Mindanao: 1 ♂ Mindanao, coll. Gribodo (MCG); 1 ♂ Surigao, 1 ♂ Dapitan, both leg. C. F. Baker (MCG).

**Vespa mandarinia** Smith

The male of this species has the clypeus distinctly separated from the eyes. Antennal segments 4-13 each with two strong tyloidea. Posterior margin of tergites 6 and 7 shallowly emarginate. The genitalia have been figured by Maa (1937, p. 43).

**Vespa mandarinia mandarinia** Smith

China: 1 ♀ Ningpo, leg. Felder (ML); Kiangsu Province, 1 ♀ 15 April 1935, 1 ♂ Chinkiang, 4 Oct. 1917, both leg. O. Piel, ex coll. van der Vecht (ML). 2 ♀ Ngan Hoi, coll. Gribodo, 1 ♀ Shanghai, coll. Gribodo, 1 ♀ 1 ♂ Hien-hien, from Gribodo, coll. Mantero (all MCG). A series from various localities (Se-Tchouen, Ta-Tsien-Lou, Siao-Lou, Hongkong, Kiangsi, Shanghai, and Kouy-Tcheou, région de PinFa) (MP). Prov. Fukien: 1 ♀ Niu-liang, Changting Hsien, 22 April 1941, 2 ♀ Lu Tun, Kienyan Hsien, 2 Nov. 1942, all leg. Tsing Chao Maa (ML).

The Chinese specimens vary somewhat in colour, but as a rule the dark

gastral bands are thinner than in the females from Japan, and the pronotum is more constantly marked with ferruginous.

**Vespa mandarinia latilineata** Cameron

*Vespa mandarinia* var. *latilineata* Cameron, 1903, Entomologist, vol. 36, p. 278, ♀ — Hitoyoshi, Japan, leg. G. Lewis (type BM?).

J a p a n : 5 ♀ 1 ♂ Yokohama, coll. Gribodo (MCG). Series from Kofou, L. Drouard de Lezey (MP, 1 ♂ ML). 4 ♀ 1 ♂ “Japan”, von Siebold (ML); 2 ♂ “Japon”, F. Ancey (ML); 1 ♀ Kobe, H. van Oort van Lauenrecht (ML). 4 ♂ Nishinomiya, Hyōgo Pref., Oct. 1958, leg. Sh. Konta, at apiary, 6 ♂ Tsukigata near Sapporo, Hokkaido, all received from S. F. Sakagami (ML).

**Vespa mandarinia nobilis** Sonan

*Vespa magnifica* var. *nobilis* Sonan, 1929, Trans. Nat. Hist. Soc. Formosa, vol. 19, p. 137 (key), 140, ♀ and ♂ — Formosa, Musha, 4 June 1927, coll. J. Sonan (Taiwan Agric. Res. Inst.); paratypes from various localities in Formosa.

F o r m o s a : 3 ♀ Tainan, leg. H. Sauter (LEW, ML); 2 ♀ Kosempo, Nov. 1908, leg. H. Sauter (ML).

**Vespa mandarinia magnifica** Smith

I n d i a : 1 ♀ Garhwal District, Rannee, 20 Oct. 1907, Mus. Collr. (MP). 1 ♀ Sikkim, coll. Gribodo (MCG). 1 ♀ 1 ♂ Assam, coll. Gribodo (MCG). 1 ♀ Shillong, Khasi Hills, 15 Nov. 1930, H. S. Rao (MC).

C h i n a : 1 ♀ 1 ♂ Haut Plateau Yunnanais, Distr. de Yunnan-fou, 850-2000 m, 25° NB (MP); 1 ♀ Se-Tchouen, Ning-Yuan-Fou, 1650 m, Dr. Legendre, 1915 (MP); series from Tsékou, Yunnan (MP, 1 ♀ 1 ♂ ML).

B u r m a : N. E. Burma, 3 ♀ Kambaiti, 7000 ft., 15, 18, and 19 April 1934, R. Malaise (NRS, 1 ♀ ML); in two of these females the thorax is black, one has it rather extensively marked with dull brown; most of the horizontal part of the pronotum, two broad, irregular lines on the mesocutum, two large marks on the scutellum, most of the meso- and metapleura, and part of the propodeum. Kachin Hills, 1 ♀ Mali Hka Valley, 1500 ft., 10 Dec. 1930, F. Kingdon Ward (BM). The following Burmese specimens have the thorax mainly reddish (var. or subsp. *bellona* Smith) : 9 ♂ Catcin Cauri, Nov. 1886, L. Fea (MCG), 1 ♂ Mti Catcin, east of Bhamò, Oct. 1886, L. Fea (MCG), 4 ♀ Carin Ghecù, 1300-1400 m, Febr.-March 1888, L. Fea (MCG); 1 ♀ 5 ♂ Carin Chebà, 900-1100 m, May-Dec. 1888, L. Fea (MCG, 2 ♂ ML); 2 ♀ 1 ♂ Chan Yoma, coll. Gribodo (MCG).



Tenasserim: 1 ♀ 1 ♂ Mt. Mooleyit, 1400-1900 m, March 1887, L. Fea (MCG).

Indo-China: 1 ♀ Bax Nahan, 16 March 1915, 1 ♀ Xieng-Khoueng, both R. Vitalis, ex coll. A. Honoré (IRSNB).

**Vespa mandarinia soror** Buysson

Burma: 5 ♀ Schwego Myo (west of Bhamò), Oct. 1885, L. Fea (MCG, 1 ♀ ML); head, scutellum, postscutellum, propodeum, and gastral segments 1 and 2 orange. Prothorax black or with small orange spots. One specimen has a transverse black line on gastral tergites 1 and 2, two have such a line on segment 1, and in the remaining two no such lines are visible.

China: Yunnan, 1 ♀ Nam Ti, Dr. Brochet, 1908 (MP); 1 ♀ Foochow, 1936-7, M. S. Yang (BM); Prov. Fukien: 1 ♀ Chih Shih (n. Bohea Hills), Chungan Hsien, 24 April 1940, 1 ♀ do., 12 Sept. 1939, 1 ♂ do., 14 Dec. 1939, all leg. Tsing Chao Maa (ML).

Indo-China: 1 ♀ Laos, B. Nakhua, 11 July 1920, R. V. de Salvaza (IRSNB).

**Vespa mocsaryana** Buysson

Indo-China: 2 ♀ Tonkin, rég. de Hoa-Binh, 1926, A. de Cooman (MP).

China: 14 ♀ Ngan Hoi, coll. Gribodo (MCG); sternites mostly entirely dark, but one worker with band on second sternite. Prov. Fukien, 4 ♀ Tachulan, Shaowu Hsien, 11 Nov. 1942, 1 ♂ do., 13-16 Nov. 1942, leg. Tsing Chao Maa (ML).

Tenasserim: 1 ♀ Malvedaung, 30 km south of Ye, 300 m, 15-25 Nov. 1934, R. Malaise (NRS). 1 ♂ Thagatà, April 1887, L. Fea ("Vespa Mocsaryana Buysson, type!") (MCG); tergite 1 with a complete apical band, tergite 2 with an interrupted band, the bands slightly widened laterally, sternites 2-4 with an apical band, on 3 and 4 more or less reduced in the middle, 5 with traces of an apical band.

Malaya: 1 ♀ "Malaya", coll. Gribodo, 1 ♀ "Malac" and "Vespa [MS name] det. Saussure", coll. Gribodo, probably ex coll. Guérin (MCG). 1 ♀ Perak (MCG), tergite 1 with band, tergite 2 with a narrow band, widely interrupted in the middle, sternite 2 with an apical band, 3 with traces of an apical band.

**Vespa mongolica** André

Japan: 1 ♀ "Japan", von Siebold (ML) (agrees with the type of *V. mon-*

*golica* var. *sexpunctata* Pérez, 1905, in MP); 2 ♀ 1 ♂ "Japan", von Siebold (ML) (agree with *V. mongolica* var. *flavata* Pérez, 1910, three syntypes in MP). 1 ♀ "Japan", F. Ancey (ML). 1 ♂ Kobé, 1916, leg. H. van Oordt-van Lauenrecht (ML). 1 ♂ Kofou, Nippon Moyen, 1906, L. Drouart de Lezey, from MP (ML). 1 ♂ Env. de Tokyo et Alpes de Nikko, 1901, J. Harmand, from MP (ML). 4 ♂ Nishinomiya, Hyôgo Pref., Oct. 1958, leg. Sh. Konta, at apiary, received from Prof. S. F. Sakagami (ML).

The varieties described by Pérez are probably no more than individual aberrations. Du Buysson's record of this species from the island of Batjan in the Indo-Malayan Archipelago is certainly based on an incorrectly labelled specimen.

Siberia: 1 ♀ Ussuri (ML).

#### ***Vespa multimaculata multimaculata* Pérez**

Borneo: 3 ♀ Sarawak, 1865-66, leg. G. Doria (MCG); 3 ♀ Brunei, coll. Gribodo (MCG). Sarawak, 4 ♂ foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 14-21 Sept. 1932, 1 ♂ R. Kapah trib. of R. Tinjar, 6 Oct. 1932, 3 ♂ Mt. Dulit, 4000 ft., moss forest (1 ♂ in house), 21-26 Oct. 1932, 3 ♂ Mt. Kalulong, 1800 ft., in primary forest, Nov. 1932, 2 ♂ Mt. Dulit, R. Koyan, 2500 ft., primary forest, 19-20 Nov. 1932 (all leg. B. M. Hobby and A. W. Moore, Oxf. Univ. Exp.; BM, ML); East Borneo, 1 ♂ Gunungsari, 95 m, 17 Aug. 1956, A. M. R. Wegner (ML).

#### ***Vespa multimaculata pendleburyi* van der Vecht**

Malaya: 1 ♀ "Renung" and "V. annulata Sm., Perak, D. Gribodo" (MCG); 1 ♂ 1 ♂ Perak, coll. Gribodo (MCG); 1 ♂ Singapore, C. F. Baker (MCG); 1 ♀ Malaya, 56/140, 1 ♀ 55/9 (BM).

Sumatra: 2 ♀ 5 ♂ Pagarangpisang ("Pangheran Pisang"), Oct. 1890 and March 1891, E. Modigliani (MCG).

#### ***Vespa orientalis* Linné**

India: 1 ♀ Banaras, Kaiser Castle, from garden on flower, 9 June 1947, T. N. v. N. (MC); 1 ♀ Bihar, Santal Parganas, from a sweet meat shop at Nonihat, 28 Nov. 1938, Dr. H. A. Hafiz (MC); 1 ♀ Tinpanar, West Bengal, 27 Febr. 1931, S. Ribeiro (MC); 4 ♂ 1 ♂ Calcutta, 18 July 1939, leg. Tsing Chao Maa (ML).

**Vespa tropica haematodes** Bequaert

India: 1 ♀ Bangalore, no. 9211/11 (MC); tergite 1 with orange yellow line at apical margin; head, pronotum and scutellum red; wings yellow, dark at anterior margin. 1 ♀ Katihar, Purneah Distr., C. A. Paiva, no. 9977/14 (MC): as the preceding specimen, but the yellow line on tergite 1 reduced. 1 ♀ Calcutta, no. 7186/14 (MC); pronotum dark. South India, 2 ♀ Alagar Kovil, Madura Distr., 19 March 1936, BM/CM Exp. (BM); 1 ♀ Dohnavur, 350 ft., Tinnevely Distr., 5 March 1936, 1 ♀ do., 8 Oct. 1938 (BM); 1 ♀ Thekkadi, Periyar Dam, Travancore, May 1937 (BM). 1 ♀ 1 ♂ Pondichery, coll. Gribodo, ex coll. Guérin ("V cincta Fab. Pondich.") (MCG). 1 ♀ Sukna, E. Himalayas, 23-30 Aug. 1928, I. M. Puri, no. 1072/H 3 (MC; transitional to *V. leefmansii*: head red with blackish blotch on frons, on each side touching the eyes, anteriorly bordered by the base of the inter-antennal shield, posteriorly by the hind ocelli; clypeus blackish at base and apex; thorax black, scutellum reddish posteriorly; tergite 1 with traces of apical line; wings rather dark).

Ceylon: 1 ♀ Trincomali, leg. Felder (ML).

China: 3 ♀ Foochow, 1937-8, M. S. Yang (BM, 1 ♀ ML). 1 ♀ "China", round label 6684, coll. Spinola (MT). 2 ♀ "Cina", from Kriechbaumer, coll. Gribodo (MCG). 4 ♀ Amoy, leg. Budding (*V. cincta*, det. Buysson, 1904; *V. tropica haematodes*, det. Bequaert, 1933); 1 ♀ "China", von Siebold (ML). Prov. Fukien: 1 ♀ Si-ying-pan, Yungan Hsien, 3 June 1940, 5 ♀ Ch'ih Shih (n. Bohea Hills), Chungan Hsien, 2 Nov. 1942, 3 ♂ Lu-tun, Kienyang Hsien, 2 Nov. 1942, leg. Tsing Chao Maa (ML).

The specimens from Fukien are transitional to *V. tropica ducalis*: first gastral tergite more or less extensively marked with ferruginous, in the darkest specimen (♀) with two spots at anterior margin of the horizontal part, and narrow apical band; in the most brightly coloured specimen (♀) entirely orange with dark irregular transverse band in the middle of the horizontal part of the first tergite; third tergite usually black, but in two workers with irregular orange markings.

Burma: 1 ♀ Minhla, D. Comotto, 1883 (MCG); 5 ♀ Palon, Pegu, Aug.-Sept. 1887, L. Fea (MCG, 1 ♀ ML). 6 ♀ 1 ♂ Carin Chebà, May-Dec. 1888, L. Fea (MCG, 1 ♀ ML; in one worker the scutellum rather dark). 1 ♀ Carin, Asciiui Chebà, 1200-1300 m, Jan. 1888, L. Fea (MCG; thorax black with small red spots on pronotum and scutellum; wings dark). 1 ♀ Karen Hills, May-June 1923, leg. Archbald (BM); 4 ♀ Rangoon, 1923, leg. Archbald (BM, 1 ♀ ML). S. Shan States, 2 ♀ Pekkong, 900 m, 8 Oct. 1934, R. Malaise (NRS, ML; in the smaller worker, which measures only 17 mm to end of second gastral tergite, the reddish colour on the thorax is reduced to six small spots,

two on pronotum, two at anterior margin of mesoscutum, and two on scutellum; the anterior margin of the clypeus and a blotch on the frons are also dark); 2 ♀ Taunggyi, 25 Sept.-13 Oct. 1934, R. Malaise (NRS, ML; the second worker is even slightly more melanistic than the darkest specimen from Pekkong, the red spots on the pronotum being very small).

Tenasserim: 1 ♀ Kawkareet, Febr. 1887, L. Fea (MCG). 1 ♀ Sukli, 75 km east of Moulmein, 600 m, 27-31 Oct. 1934, R. Malaise (ML); 1 ♀ Mekane, 90 km east of Moulmein, 200 m, 2-8 Nov. 1934, R. Malaise (NRS).

The specimens from Burma and Tenasserim appear to be transitional between typical *V. tropica haematodes* from India, Ceylon, and certain parts of China, and the darker subsp. *leafmansi*; they have a variable amount of red on head and thorax, but the wings are dark, in some specimens entirely fuscous (Pegu; Rangoon), in others more or less yellowish at apex. The available material is not sufficient for an adequate study of the variation of the species in this area.

#### ***Vespa tropica ducalis* Smith**

China: 6 ♀ 3 ♂ Shanckow, Honan, D. Renuard (IRSNB, 2 ♀ 1 ♂ ML); 1 ♀ Pingshiang, Dr. Kreyenberg (ML); 1 ♂ Foochow, 1937-8, M. S. Yang (BM). 1 ♀ Ngan Hwei, 1 ♀ 1 ♂ Shanghai, coll. Gribodo (MCG). 4 ♀ Ningpo, leg. Felder (ML); 1 ♀ Prov. Kiangsu, Zi-ka-wei, Shanghai, 25 May 1925, leg. O. Piel, ex coll. van der Vecht (ML); Prov. Fukien, 2 ♀ Tachulan, Shaowu Hsien, 13-17 Aug. 1945, leg. Tsing Chao Maa (ML).

#### ***Vespa tropica pulchra* Buysson**

Japan: 1 ♀ Yokohama (coll. Guérin-Méneville, 1897) (MP), herewith selected as the lectotype; 1 ♀ "Japan", Boucard, 1900 (syntype, MP, head lacking); 1 ♀ Kofou, 1906, L. Drouard de Lezey (MP); 1 ♀ Tokyo, 1906, E. Gallois (MP); 2 ♀ Tokyo, 1906, J. Harmand (MP); 1 ♂ Shinjiku, 1907, E. Gallois (MP). 4 ♀ "Japan", F. Ancey (ML); 1 ♀ Fukuoka, Kiusiu, June 1945, R. van der Veen (ML). 1 ♀ Japan, 1 ♀ Yokohama (MCG); 1 ♀ Tokio, 1878, Chiossone (MCG). 1 ♀ Japan (ZSM).

The male from Shinjiku has the following parts yellow: head, a wide band on pronotum, two spots on mesoscutum near anterior margin, a band on posterior half of scutellum, two spots on postscutellum, tergite 1 and 2 (except for transverse black line in the middle) and apical bands of tergites 3 and 4.

#### ***Vespa tropica pseudosoror*, new subspecies**

♀ or ♂ — Black; the following parts orange-yellow or pale ferruginous:

head (vertex with a dark blotch enclosing the ocelli, mandibles brownish on outer side, cutting edge blackish), an irregular transverse band on pronotum, scutellum and postscutellum, gastral tergites 1 and 2 (each with more or less dark transverse band at a short distance from the posterior margin), an irregular apical fascia on second sternite. Legs more or less brownish, outer side of tibiae ferruginous yellow. Wings russet-yellow; brown along costal margin.

**I n d o - C h i n a:** Annam, 1 ♀ or ♂, Lién-Chiên près Tourane, 1000 m, Mme Poilane, 1923 (holotype, MP); Tonkin, 1 ♀ or ♂ région de Tien-Yen et de la Baie d'Alerez, Lieut. Poimeur, 1908 (paratype, ML).

This remarkable form agrees very closely in coloration with *Vespa mandarinia soror*; in fact, du Buysson's original series of *soror* has proved to contain specimens of both species (see van der Vecht, 1957, p. 16). In the two specimens described above the propodeum is entirely black, whereas it is mainly orange-yellow in all available specimens of *V. mandarinia soror*.

**F o r m o s a:** 1 ♀ Thaihanroku, 19-26 April, 1908 (*V. tropica* var. *soror* Buysson, det. Bequaert, 1933) (ML); 3 ♀ Kosempo, 1911, H. Sauter (*V. ducalis* Sm., det. Rengel) (ML); 2 ♀ Kaushirei, 1 May 1908, H. Sauter (ZSM). — These specimens resemble those from Indo-China very closely; the band on the pronotum is wider and reaches the posterior margin; the dark blotch on the vertex is indistinct or absent.

#### ***Vespa tropica eulemoides* Buysson**

**A n d a m a n I s.:** 1 ♀ Pt. Blair, leg. Giglioli, 1891 (type, MCG); 1 ♀ Port Blair, March 1909, H. Weskin (MC).

#### ***Vespa tropica leefmansi* van der Vecht**

**W e s t B e n g a l:** 1 ♀ Darjiling Distr., Singla, 1500 ft, Febr. 1913, ex coll. Lord Carmichael, no. 1066H3 (MC).

**A s s a m:** 1 ♀ Margherita, no. 9794/8 (MC); 1 ♂ "Assam" (MCG).

**B u r m a:** Myitkyina Distr., 1 ♀ Hopin, 1 ♂ Chaungwa, Oct. and Nov. 1926, B. N. Chopra, nrs. 1071/H3 and 1074/H3 (MC), 3 ♀ Washaung, 20 km east of Myitkyina, 14 July 1934, R. Malaise (NRS, ML). 4 ♀ Schwego Myo, Oct. 1885, L. Fea (MCG); 2 ♀ Bhamò, July 1885, 1 ♀ do., July 1886, L. Fea (MCG).

**T e n a s s e r i m:** 1 ♀ Malewoon, July-Aug. 1887, L. Fea (MCG).

**I n d o - C h i n a:** 1 ♀ Tonkin, région de Ha-Giang, Siebens Olivier, 1916 (MP); 1 ♀ Tonkin, environs immédiats de Lao-Kay, Capitaine Sauvez, 1908 (MP); 1 ♀ Cambodge, Kompong Luong, R. Oberthür, 1902 (MP). 2 ♀ Laos, B. Na Khua, July 1920, R. V. de Salvaza (IRSNB), 1 ♀ Cochinchine, Hanh

Lui (?), 21 May 1927, R. V. de Salvaza (IRSNB), 1 ♀ Saigon, 1 June 1923, R. V. de Salvaza (IRSNB).

S i a m: 1 ♀ S. Siam, Trang Waterfall, 1 Aug. 1935, Dajak Layang Gaddi (IRSNB).

M a l a y a: 1 ♀ P. Penang, 600-800 m, Febr. 1889, Loria & Fea (MCG); 1 ♀ Perak, leg. F. Moser (ZSM).

S u m a t r a: 1 ♂ "Sumatra", coll. Gribodo (MCG); 1 ♀ Kajutanam, July and Aug. 1878, O. Beccari (MCG); 1 ♀ Balighe, 1 ♀ Sibolga, 1 ♀ Pagaran-pisang ("Pangheran Pisang"), Oct. 1890-March 1891, E. Modigliani (MCG); 1 ♀ Padang, 1890, E. Modigliani (MCG). 2 ♀ 2 ♀ Sandaran Agong, Korinchi Lake, 2450 ft., May and June 1914, 1 ♀ Sungei Penok, Korinchi Valley, 2600 ft., March 1914 (BM). 1 ♀ Sibolangit, leg. Lörzing (LEW). 2 ♀ "Sumatra", Dr. Martin, 2 ♀ Tebing Tinggi, Dr. Paster (ZSM).

I s l a n d s w e s t o f S u m a t r a: 2 ♀ Nias, 1897-8, U. Raap; 1 ♀ Batu I., 1896-7, U. Raap; 1 ♀ Engano, Bua-bua, May-June 1891, E. Modigliani; 1 ♀ "Engano", coll. Gribodo (all MCG).

B o r n e o: 2 ♀ 1 ♀ Sarawak, 1865-6, leg. G. Doria (MCG), one female has an orange band, almost as wide as an antenna, abbreviated laterally, on apical margin of tergite 3, and a wider irregular band on sternite 3. 1 ♀ Sandakan, C. F. Baker (MCG). Sarawak, 1 ♀ foot of Mt. Dulit, junction of R. Tinjar & Lejok, 2 Sept. 1932, 1 ♀ R. Kapah, trib. of R. Tinjah, 7 Oct. 1932, in clearing, B. M. Hobby & A. W. Moore, Oxf. Univ. Exp. (BM), in both specimens the third sternite has a reduced apical band, in the ♀ from R. Kapah the first gastral tergite has a narrow orange line at the posterior margin. 6 ♀ Sintang, 1910 (ZSM), 1 ♀ Martapura, leg. ? Haufland (ZSM).

### **Vespa tropica tropica** (Linné)

J a v a: 7 ♀ and ♀ "Java", coll. Gribodo (MCG); 2 ♀ Buitenzorg (Bogor), 1875, G. B. Ferrari (MCG). 1 ♀ "Vespa tropica Lin. al MB, D. Klug, China", coll. Spinola (MT); the label shows that Klug (Mus. Berlin) had correctly identified Linnaeus's "*Sphex tropica*" long ago; the locality label of this specimen is undoubtedly incorrect. Series, ♀ and ♀, Sukabumi (IRSNB). 2 ♀ Buitenzorg, 1 ♀ Blawan, 2 ♀ Bajukidul (LEW). 7 ♀ "Java" (ZSM).

B a l i: 1 ♀ "Bali", coll. Gribodo (MCG).

S u m b a w a: 1 ♀ Tambora, coll. Gribodo (MCG).

### **Vespa tropica deusta** Lepelletier

The Spinola collection (MT) contains 2 ♀, both without head, one with label "V. deusta le Pell. coll. Serville", one without label; the first is herewith

designated as the lectotype of *Vespa deusta* Lepeletier. The specimens stand in front of a box label "Vespa [MS name] Hagemb ♀ Java D. de Hoffmansegg [?added later:] and L. Pell.", but they are certainly not from Java. Since they agree completely with my interpretation of *Vespa deusta* Lep., the possibility that Lepeletier's type originated from Buru (see van der Vecht, 1957, p. 24) may now be ruled out.

Luzon: 1 ♀ Baguio, Benguet, Baker (MCG).

Mindoro: 2 ♀ Mindoro, coll. Gribodo (MCG).

### ***Vespa tropica anthracina* Bequaert**

Palawan: 3 ♀ 1 ♂ Palawan, coll. Gribodo (MCG).

Mindanao: 5 ♀ and ♂ "Mindanao", coll. Gribodo (MCG); 1 ♀ Davao, 1 ♀ Zamboanga, 1 ♀ Tangkolan, Bukidnan, all leg. C. F. Baker (MCG).

### ***Vespa tropica trimeres* van der Vecht**

Celebes: 2 ♀ Celebes, coll. Gribodo (MCG); 1 ♀ Macassar, coll. Gribodo (MCG); 1 ♀ Pic of Bonthain, coll. Gribodo (MCG); 2 ♀ Minahasa, coll. Gribodo (MCG).

Sula Is.: 2 ♀ Sula Islands, coll. Gribodo (MCG).

Flores: 1 ♀ Mbora, 30 March 1958, A. M. R. Wegner (ML).

Amboina: 4 ♀ 1873, 1 ♀ Dec. 1874, O. Beccari (MCG); in one of the females collected in 1873 the first gastral tergite has a strongly reduced orange band, the second tergite has a narrow dark band at the base and a conspicuous dark spot on each side near the middle; second sternite dark with only the posterior corners yellow.

Morotai: 1 ♀ Morty, coll. Gribodo (MCG).

New Guinea: 1 ♂ Ansum, April 1875, O. Beccari (MCG); 1 ♀ Yule Island, May 1875, L. M. d'Albertis (MCG); 1 ♀ Bara-bara, Jan.-Febr. 1890, 6 ♀ and ♂ Dilo, May-June 1890, 4 ♀ and ♂ Kapakapa, May-June 1890, 1 ♀ Bujakori, Aug. 1890, 6 ♂ Moroka, July-Nov. 1893, 1 ♀ Haveri (in Moroka), July-Nov. 1893, all leg. L. Loria (MCG).

### ***Vespa tropica trisignata* Pérez**

Timor: 1 ♀ Timor, ex coll. Ritsema (MCG).

Ceram: 1 ♀ Wahai, March 1872, L. M. d'Albertis (MCG).

The Spinola collection (MT) contains 2 ♀ "Vespa [MS name], ♀ MB, Nouv.-Holl., D. Klug"; it appears doubtful whether the locality label is correct.

**Vespa tropica unicolor** Smith

Buru: 1 ♂ Buru, coll. Gribodo (MCG).

**Vespa variabilis variabilis** Buysson

China: 1 ♀ Mou-pin, leg. David (MP; herewith selected as the lectotype). Prov. Fukien, 4 ♂ Ch'i-Li-Ch'iao, Chungan Hsien, 17 Oct. 1941, leg. Tsing Chao Maa (ML).

In the lectotype of *Vespa variabilis* the abdomen is brown, with vague dark transverse bands on the tergites. The series from Fukien agrees well with the type. The species is probably widely distributed in China, but may have been overlooked on account of its resemblance to *V. mandarinia mandarinia* and *V. analis parallela*.

It differs from the first in having the temples less strongly swollen, and from the latter in the shape of the clypeus, which has no median tooth anteriorly. The clypeus is characteristic, it is rather strongly swollen in the basal two thirds, and here finely punctate, the anterior third is depressed, with rather coarse and dense puncturation. The male of this species is yet unknown.

A worker from Borneo, ex coll. Sichel (MP), mentioned by du Buysson (1905, p. 523), is very probably incorrectly labelled.

**Vespa variabilis fumida**, new subspecies

Worker. — Head orange-brown, antennae black with orange-brown scape and pedicel; thorax black, with two brownish marks on pronotum, and a brown mark on outer margin of the tegulae; gastral segments 1-5 black, 6 yellow, the first tergite with very narrow brownish yellow apical band, which is widely interrupted in the middle. Legs black or brownish black; femora, tibiae and tarsi of fore legs orange-brown; apical tarsal segment of mid and hind legs yellowish brown, with dark spot above. Wings rather strongly infuscated, darker than in Chinese specimens.

India: 2 ♀ "British Bootan", Padong, L. Durel, 1913, from R. Oberthür, 1914 (holotype MP, paratype ML); 1 ♂ Darjiling, 7000-8000 ft., Oct. 1941, H. A. Hafiz (MC).

This remarkable form differs only very little in coloration from *V. mandarinia magnifica* and *V. analis nigrans*, which both have the gastral tergites with distinct, though narrow, pale apical bands.

**Vespa velutina pruthii**, new subspecies

Female and worker. — Very similar to *V. velutina auraria*, but apparently constantly differing in the colour of the legs.



Head and thorax as in subsp. *auraria*; mesoscutum black with two more or less distinct ferruginous lines; mesopleura black, with brown mark under the tegulae; gaster orange-brown, vertical base of first tergite more or less extensively black, horizontal part with transverse dark line, slightly farther from the posterior than from the anterior margin; basal half of second tergite more or less extensively marked with black. Legs: coxae and trochanters black; fore femora red, mid and hind femora black, partly reddish; all tibiae and tarsi red.

Type: ♀, Kashmir, Srinagar, Aug.-Sept. 1932, Hem Singh Pruthi (MC); all specimens recorded below are paratypes.

Pakistan: 2 ♀ Chitral, Madaglasbt, N. W. F. Province, 9 Sept. 1929, B. N. Chopra (MC); Punjab, 2 ♀ Murree, Khani Tak, 4700 ft., 18 Sept. 1928, H. S. Pruthi (MC), 2 ♀ Murree Hills, Bhuban, 6000 ft., June 1934, H. S. Pruthi (MC, ML).

Kashmir: 4 ♀ Srinagar, Aug.-Sept. 1932, H. S. Pruthi (MC, ML); 1 ♀ Shardi, 19 May 1954, F. Schmid (ML).

#### ***Vespa velutina auraria* Smith**

India: 1 ♀ Simla, 2500 m, July (ML); 1 ♀ Garhwal, Lohba, 5000 ft., 17 April 1914, leg. Tytler (MC). — These specimens have the legs coloured as described by Smith (1852): “the anterior femora in front towards their base, the coxae behind, and the intermediate and posterior coxae and femora, black; the intermediate tibiae, except their apex outwardly, the posterior in front and a spot towards their apex within, black.” I suspect therefore that the type, described from “Northern India”, originated somewhere from that part of the Himalayas which is situated approximately between 75 and 80° E.L.

The following specimens have the fore femora partly black, fore tibiae red, mid and hind femora and tibiae black. Assam, 1 ♀ Nartiang, Khasi and Jaintia Hills District, 28-29 Nov. 1930, H. S. Rao (MC), 1 ♀ Cherrapunji, 4400 ft., 2-8 Oct. 1914, S. W. Kemp (MC); 2 ♀ 4 ♀ Shillong, Sept. 1903 (BM, ML); 2 ♀ “Assam”, coll. Magretti (MCG).

China: During my visit to the Paris Museum in August 1956 I examined the following specimens from Yunnan: 3 ♀ 7 ♀ Tsé-kou, Mgr. Soulié, from R. Oberthür, 1898-1901; 3 ♀ S.-Préf. de I-Lang, 1650 m, J. de Mecquenem, 1906; 1 ♀ Kien Chang, chaîne du Siao Siang Ling, 2500 m. — At that time I noted: These specimens differ from *V. velutina variana* mainly in having the tergites 5 and 6 orange-yellow, and the anterior femora yellowish brown, slightly fuscous at the base. They resemble the Malayan subsp. *divergens* Pérez, but differ in having the basal half of the horizontal part of the first gastral tergite and the basal two thirds of the second tergite black or dark

brown. In my key to the Indo-Malayan subspecies of *V. velutina* (1957, p. 34) this form runs to no. 7; it may then be separated from *variana* by the characters given above, and from *timorensis* by the brightly coloured scutellum and third and fourth gastral tergites". Prof. Tsing Chao Maa sent me a worker from Chin Ma Szu, Kunming, 15 July 1940.

B u r m a : 9 ♀ N. E. Burma, Kambaiti, 7000 ft., 27 March-8 June 1934, R. Malaise (NRS, ML).

#### ***Vespa velutina variana* van der Vecht**

B u r m a : 19 ♀ and ♂, Carin Chebà, 900-1100 m, May-Dec. 1888, L. Fea (*V. velutina* var. *ardens* det. Buysson) (MCG, 2 ♀ ML); 2 ♀ Catcin Cauri, Nov. 1886, L. Fea (MCG); 4 ♀ 8 ♂ 1 ♂ Chan Yoma, coll. Gribodo (MCG). Southern Shan States, 1 ♀ 1 ♂ Road 40 km east of Taunggyi, 25 Sept.-13 Oct. 1934, 2 ♀ Inle Lake, south end, Taungdo, 900 m, 10 Sept. 1934, 1 ♂ Taunggyi, 1 Aug.-22 Sept. 1934, 1 ♀ Pekkong, 900 m, 8 Oct. 1934, all leg. R. Malaise (NRS, ML).

#### ***Vespa velutina nigrithorax* Buysson**

C h i n a : 1 ♂ Da-zeh near Tychau, Walker coll. no. 93-52, 10265 (BM); 1 ♂ "North China" (round label) [probably from environs of Ningpo, leg. Fortune] (BM); 4 ♀ 9 ♂ Foochow, 1935, 1937, M. S. Yang (BM). 2 ♀ Ngan Hoei, coll. Gribodo (MCG); 1 ♂ China (*V. velutina* var. det. Kriechbaumer) (MCG); Prov. Fukien: 1 ♀ Tachulan, Shaowu Hsien, 13-16 Febr., 4 ♀ 2 ♂ do., 2 Sept. 1943, all leg. Tsing Chao Maa (ML).

#### ***Vespa velutina flavitarsus* Sonan**

*Vespa flavitarsus* Sonan, 1929, Trans. Nat. Hist. Soc. Formosa, vol. 19, p. 137 (key), 142, ♀ and ♂ — Formosa, Taiko-san (Kagi), 4-10 Febr. 1924 (coll. M. Kato) (paratypes from several localities in Formosa in various collections).

*Vespa auraria flavitarsis* (!) Maa, 1937, Ent. & Phytopath., vol. 5, p. 31 (♀ from Rimogan, Formosa, compared with *auraria* and *nigrithorax*).

F o r m o s a : 1 ♂ Kusukusu, 20 April 1928, J. Sonan, from Taiwan Agric. Res. Inst. (BM); 1 ♀ Suishako, Central Formosa, 1911-288 (BM); 1 ♀ Taiwan, Hori, May-June 1947, coll. Maa, Chen and Lin (BM); 2 ♀ Kosempo, Nov. 1911, H. Sauter (ML).

In the specimen from Hori the bands on gastral tergites 1-3 are slightly wider than usual, and there is also a rather distinct band at the base of the horizontal part of the first gastral tergite (in the other specimens almost absent).

**Vespa velutina divergens** Pérez

Malaya: 1 ♀ Perak, coll. Gribodo (MCG).

**Vespa velutina karnyi** van der Vecht

Sumatra: 1 ♂ West Sumatra, Lebong Tandai, 3500 ft., July 1923, in moth trap, C. J. Brooks (BM); 2 ♀ Mt. Sibajak, 1400-1800 m, 9 June 1929, H. von Hayek (ZSM). 3 ♀ 5 ♂ Mts. Singhalang, July 1878, O. Beccari (MCG); 1 ♂ Si-Rambe, 2 ♀ D. Tolong, 1890-91, E. Modigliani (MCG).

**Vespa velutina velutina** Lepeletier

Java: 1 ♀ "Vespa [MS name] Hoff = V. velutina var. De Sauss., Java, D. de Hoffmannsegg", coll. Spinola (MT) [the specimen is in poor condition, the head is lacking]; 2 ♀ "Vespa velutina Hagen, Bengale, D. Buquet", coll. Spinola (MT) [these specimens are certainly from Java, not from Bengal!]. 1 ♀ Mt. Pangrango, 7000-10,000 ft., Jan. 1936, Miss L. E. Cheesman (BM). 11 ♀ Sukabumi (IRSNB). 1 ♂ Buitenzorg (Bogor), G. B. Ferrari, 1878 (MCG); 1 ♀ Tjibodas, 1874, O. Beccari (MCG); 7 ♀ and ♂ Ardjuno, coll. Gribodo (MCG); 1 ♀ "Vespa velutina Dehaan, Java, Det. Saussure" on old label, perhaps from coll. Guérin (MCG).

**Vespa velutina ardens** Buysson

Sumbawa: 6 ♀ and ♂, 1 ♂ Tambora, coll. Gribodo (MCG); 2 ♀ "Sumbawa", coll. Gribodo (MCG).

**Vespa velutina floresiana** van der Vecht

Flores: 4 ♀ 8 ♂ Rana Mese, 1300-1500 m, April 1958, A. M. R. Wegner (MZB, ML); 1 ♀ "Flores", coll. Gribodo (MCG).

**Vespa velutina celebensis** van der Vecht

Celebes: 1 ♀ Pic of Bonthain, South Celebes, coll. Gribodo (MCG).

**Vespa vivax** Smith

Tibet: 1 ♀ (or ♂?) Rongshar Valley, 11,000 ft., 27 June 1924, Maj. R. W. G. Hingston (Everest Exp., Br. Mus., 1924-386) (BM).

China: 1 ♀ Se-Tchouen, Ta-Tsien-Lou, 1899, "chasseurs indigènes", from R. Oberthür, 1901 (MP).

India: 2 ♂ Sikkim, Padamtsin — Lingtou, July 1901, from R. Oberthür (MP). 1 ♀ W. Himalayas, Kumaon, Bhagarkote, 8000 ft., 28 April 1914, leg. Tytler (MC); 1 ♂ Mt. Hatiau, near Bagli (or Baghi?), Simla Hill States, 10,400 ft., S. W. Kemp, no. 1058H3 (MC).

Burma. 1 ♀ N. E. Burma, Kambaiti, 7000 ft., 15 April 1934, 1 ♂ do., 18 April, leg. R. Malaise (NRS, ML).

**Vespa walkeri** Buysson

China: 2 ♀ or ♂, ex coll. Walker, Hai-ning, 13/52 (MP, syntypes, both labelled "type" by du Buysson).

Japan: 12 ♀ 1 ♂ Nippon Moyen, Kofou, L. Drouard de Lezey (MP, 1 ♀ ML).

The male of this species (fig. 1, g-k) has the clypeus separated from the eyes by a very narrow margin. Clypeus rather coarsely, but superficially, punctate. Antennal segments 4-13 with distinct tyloides. Oculo-malar space rather long. Mesoscutum rather densely punctate, the punctures generally smaller than the interspaces. Sixth gastral sternite with wide and rather deep emargination, the seventh sternite shallowly emarginate. Genitalia: fig. 1j.

#### LITERATURE

- BEQUAERT, J., 1930. On the generic and subgeneric divisions of the Vespinae. — Bull. Brooklyn Ent. Soc., vol. 25, pp. 59-70.
- , 1931. The color forms of the common hornet, *Vespa crabro* Linnaeus. — *Konowia*, vol. 10, pp. 101-109.
- , 1936. The common oriental hornets, *Vespa tropica* and *Vespa affinis*, and their color forms. — *Treubia*, vol. 15, pp. 329-351, 2 figs.
- , 1939. The oriental *Vespa analis* and its color forms, etc. — *Trans. Am. Ent. Soc.*, vol. 65, pp. 37-42.
- BUYSSON, R. DU, 1904-5. Monographie des Guêpes ou *Vespa*. — *Ann. Soc. Ent. France*, vol. 72 (1903), pp. 260-288, pls. III and IV; do., vol. 73 (1904), pp. 485-556, 565-634, pls. 5-15.
- MAA, TSING CHAO, 1937. On some *Vespa*- and *Vespula*-species of China. — *Ent. & Phytop.*, vol. 5, pp. 29-34.
- , 1937. Comparative Anatomy of the Male Genitalia of Some *Vespa*- and *Vespula*-species. — *Ent. & Phytop.*, vol. 5, pp. 38-47, figs.
- PÉREZ, J., 1905. Hyménoptères recueillies dans le Japon central par M. Harmand, Ministre plénipotentiaire de France à Tokio. — *Bull. Mus. Hist. Nat. Paris*, vol. 11, pp. 79-87.
- , 1910. Note sur les Vespides. — *Act. Soc. Linn. Bordeaux*, vol. 64, pp. 1-20.
- VECHT, J. VAN DER, 1957. The Vespinae of the Indo-Malayan and Papuan areas. — *Zool. Verh. Rijksmus. Nat. Hist. Leiden*, no. 34, pp. 1-83, 10 figs., 6 pls.