THE GENUS *PISON* SPINOLA OF THE JAPANESE EMPIRE (HYMENOPTERA, TRYPOXYLONIDAE)

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ONE PLATE AND TWO TEXTFIGURES

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In his work, "Hyménoptères de Korée" (Horae Soc. entom. Ross., vol. 21, p. 433, 1887), Dr. C. Radoszkowski gave an insufficient description of a new Korean *Pison* under the name *Paraceramius Koreensis* (= *Pison koreensis*), however no one has discussed on this species ever since. In 1913, Prof. E. Strand reported *Pison fabricator* Smith (= *Pison punctifrons* Shuckard) from Formosa. In 1931, Mr. J. Sonan recorded the same wasp from the Pescadores Islands and in the following year Mr. M. Yano added it to the fauna of Japan proper. Most recently this species was recorded by myself from Ishigaki Island in the additions to the hymenopterous fauna of the island. So far as I am aware, these represent the entire knowledge of the Genus *Pison* in the Japanese Empire at present.

On the other hand the biology of *Pison fabricator* Smith (auct.) was fairly well investigated by Messrs. J. Sonan (1925) and H. Katayama (1934) both in Formosa and Japan respectively. The list of the preys published by Mr. H. Katayama includes such spiders as *Hasarius doenitzi* Karsch, *Plexippus paykulli* Audouin and *Agelena opalenta* L. Koch.

In China, there are known four species so far, i. e. *Pison regale* Smith (1852) from Hsikou, near Tientsin and from Ning-po-foo; *Pison assimile* Sickmann (1895) from Tientsin; *Pison insigne* Sickmann (1895) from Nankou Pass and *Pison punctifrons* Shuckard (1837) from Hong Kong and Foochow.

Of these four species mentioned above, *Pison regale* Smith was recently recorded from Tigrovaja and *Pison insigne* Sickmann from Fl. Majche, both in Ussuri-region by Dr. V. Gussakovskij (Arkiv för Zoologi, Bd. 24 A, no. 10, p. 9–10, 1932).

In the Entomological Laboratory of the Kyushu Imperial Univer-

sity, there are preserved a series of interesting species of the Genus *Pison*, presented or in loan for identification. This paper is intented to represented the first part of my monographic reports on the Trypoxylonidae of the Japanese Empire.

Before going further I express my hearty thanks to Messrs. Octave Piel of Shanghai, Nobuyoshi Tosawa of Osaka, Kunio Iwata of Kyoto, Haruo Furukawa of Tokyo, Kichinosuke Iida of Kyoto, Toyoaki Harada of Tokyo, Ryoiti Takato of Kurashiki, Morimichi Ueno of Fukuoka as well as Professor Embrik Strand of Riga for their invaluable help in providing both specimens and literature in the course of the present study. I wish to thank also Professor Teiso Esaki of the Kyushu Imperial University for his kindness rendered in the preparation of the manuscript.

Key to the species of *Pison* occuring in the Japanese Empire, Ussuri-region and China

1. Fore wing with two cubital cells ... . *Pison* (*Pisonoides*) *koreensis* (Radoszkowski)
   Fore wing with three cubital cells 2
2. Postocellar line apparently shorter than ocello-ocular line 3
   Postocellar line almost as long or slightly longer than ocello-ocular line... 5
3. Front with a median, longitudinal carina. Pubescence on head, thorax above and abdomen black... ... ... *Pison regale* Smith
   Front without a median carina. Pubescence almost pale brown 4
4. First abdominal sternite with a longitudinal sulcation ... ... *Pison strandi* sp. nov.
   First abdominal sternite without a longitudinal sulcation ... ... *Pison iwatai* sp. nov.
5. Mesopleuron with a tubercle near the coxal cavity of mid-legs ... ... *Pison insigne* Sickmann
   Mesopleura without such tubercles 6
6. Clypeus strikingly produced anteriorly with the apex somewhat quadrate... ... ... *Pison tosawai* sp. nov.
   Clypeus produced anteriorly, but with the apex somewhat pointed. 7
7. Fourth segment of antenna slightly shorter than third ... ... *Pison punctifrons* Shuckard
   Fourth segment of antenna about twice as long as third... ... ... *Pison assimile* Sickmann

1. *Pison* (*Pisonoides*) *koreensis* (Radoszkowski)

1887 *Paraceramius Koreensis* Radoszkowski, Horae Soc. entom. Ross., vol. 21, p. 443, ♀.
1894 *Ceramius Koreensis* Dalla Torre, Cat. Hymen. system. & synonym., Lipsiae, vol. 9, p. 3.
1897 *Pison koreense* Kohl, in Dalla Torre's Cat. Hymen. system. & synonym., Lipsise, vol. 8, p. 712.
1916 *Pison* (*Pisonoides*) *koreensis* Turner, Proc. Zool. Soc. London, 1916, p. 617.

" Tête par sa forme générale rappelle celle de Nyssonides ; mais ses yeux sont grandes et échancrés au milieu ; antennes en massue allongée. Corselet de la forme des Crabronides, prothorax mince. Premier segment abdominal campanule, chaque des segments suivants en dessus bombé, a sa base faiblement étranglé. Pieds nus. Ailes ayant deux cellules cubitales ; chaque des cellules reçoit une nervure récurrente. Femelle. Noire. Chaperon arrondi, la tête un peu plus large que le thorax. Corselet a peine parsemé de poils courts blanchâtres ; metathorax luisant portant au milieu une ligne fortment enfoncée. Abdomen noire nu ; les bords postérieurs des segments sont decolorés et disposés en dessus et dessous de l'abdomen on forme des bandes ; les parties decolorées en dessus de l'abdomen sont cilliées régulièrement de poils blanchâtres couchés assez longs ; ces cils sont plus longs sur le troisième segment, occupant la moitié de la partie noire. Pieds noirs, jambes et tarses rousses foncées. Ailes transparentes, a peine foncées vers l'extremite ; cellule radiale grande, triangulaire, deuxième cubial quatre fois plus petite que la première, fortment retrècie vers sa base. Ecailles rousses. Long. 6 mill."

I give here some notes on the specimens collected from Honshu, Japan.

♀. Black. Mandibles pale brown except for brownish black apex. Maxillary and labial palpi yellowish white. Tegulae pale brown. Posterior margin of pronotum at humeral angles somewhat pale brown. Base and apex of femur, tibia and the fifth tarsal segment of fore legs yellowish brown. Base and apex of tibia and the fifth tarsal segment of mid- and hind legs, tibial spurs as well as claws of all legs yellowish brown. Wings transparent, slightly smoky and the outer margin slightly darkened, with nervures brownish black except for the base of *C*, *Sc* + *R* + *M* and *Cu* which are pale brown in coloration ; violaceously reflecting in certain aspect. Apical margin of each abdominal segment pale brown.

Body covered with short, grayish white pubescence. Pubescence

on lower portion of front, on clypeus, on posterior margin of pronotum as well as posterior margin of humeral angles silver-white.

Punctuation on head, thorax and abdomen very minute, almost inrecognizable. Mesonotum, scutellum, postscutellum, propodeum, the second and the following abdominal segments very shining.

Head wider than long in facial aspect. Front very convex, with a short, median, longitudinal, weak, impressed line before the anterior ocellus. Distance from the anterior ocellus to the posterior ones equal in length of the postocellar line. Pol : Ool = 7 : 3. Postgena not well developed, eyes about three times as long as postgena in profile. Clypeus short and narrow with the anterior margin rounded. Eyes covered with dense, minute, grayish pubescence. Antennae short and the shape is somewhat claviform. Relative length of the segments of antenna : I : II : III : IV = 7 : 5 : 5 : 6. The second antennal segment as long as wide, third, fourth and fifth slightly longer than wide, and each of

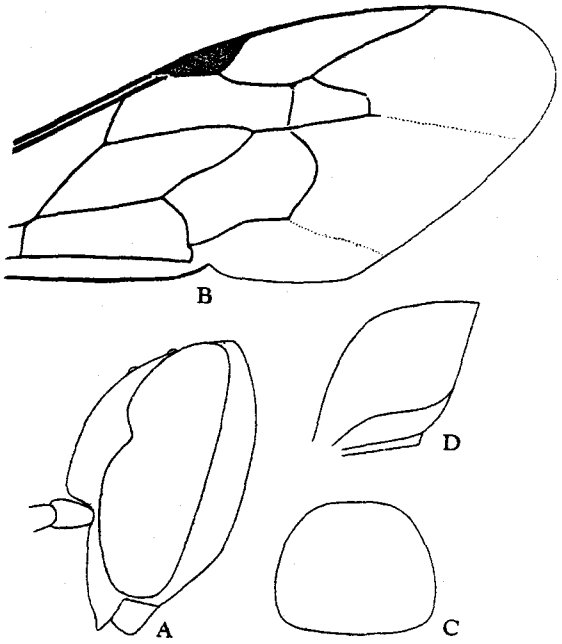

Fig. 1. *Pison koreensis* (Radoszkowski), ♀. A: Head in profile. B: Apical half of fore wing. C: First abdominal tergite in dorsal aspect. D: The same above in profile.

the following segments slightly wider than long. Mesonotum with a distinct, very short, parapsidal furrows. Scutellum slightly convex, slightly wider than long, more than twice the length of postscutellum. Mesothorax with a short, longitudinal impression at the ventro-lateral portion of epimeron. Propodeum, seen from above, rounded, slightly narrowing towards the apex, with the caudal portion truncate, with a distinct, median, longitudinal furrow and without any striae. The truncated caudal area transversely striated. Posterior margin of each abdominal tergite distinctly depressed (on the first the depression is entire, but on the following segments it is feeble in the middle and only moderately pronounced at the sides). First abdominal sternite without any striae or furrows, but with dense, minute punctures.

Length : Head seen from above 1.0 mm., thorax 2.7 mm., first and second abdominal tergites put together 2.1 mm., fore wing 4.8 mm., hind wing 1.2 mm.

Width : Head 2.1 mm., thorax 1.9 mm., first abdominal tergite 1.4 mm., second tergite 1.6 mm.

Habitat : Korea and Japan (Honshu).

I have examined one female specimen collected by Mr. K. Iida (7. xi. 1932, Kyoto, Honshu, Japan). This is the first record of the species from Japan, The specimen is now preserved in the Entomological Laboratory, Department of Agriculture, Kyushu Imperial University, Fukuoka.

2. *Pison strandi* sp. nov.

♀. Brownish black. Apical portion of mandibles ferruginous except for the extreme apex. Tegulae brown with the basal portion brownish black. Wings transparent, somewhat brownish, violaceously reflecting in certain aspect, with nervures black. The colour of wings slightly paler than that of *Pison regale* Smith and the outer margin neither infuscated nor margined.

Body covered with grayish or pale brownish hairs. Hairs on lower portion of front and on clypeus very dense and somewhat golden in coloration.

Punctures on head and thorax strong and dense, on vertex of head and scutellum slightly stronger and more sparse, on postscutellum very minute and dense. Punctures on the first abdominal tergite more sparse than those on mesonotum, on basal portions of the following tergites very minute and dense, on the posterior depressed portion slightly

sparse and on the remaining basal portion of each tergite slightly large and much more sparse. Punctures on the ventral side of the first tergite somewhat dense. The first sternite strongly punctured and somewhat rugose. Punctures on basal two-thirds of the second sternite very strong, large and coarsely scattered, on the following sternites less stronger than those on the first sternite and sparse except for the apical depressed portion where punctures are minute and dense, those on the sixth sternite conspicuously minute and dense. Tegulae impunctate. Propodeum with a median, longitudinal sulcation which is costate transversely. Propodeum with oblique striae which become irregular before reaching the sides and somewhat rugoso-striate at the sides. Sculpture of propodeum almost exactly the same as in *Pison regale* Smith.

Head somewhat broader than long seen in front. Eyes as long as postgena in profile. Front moderately convex, with a low tubercle instead of a longitudinal median carina just above the insertions of antennae. Pol : Ool = 10 : 13. Impressed line along the posterior margin of each posterior ocellus distinct. Clypeus somewhat convex with the anterior margin slightly produced. Relative length of the segments of antenna : III : IV : V : XII = 15 : 12 : 12 : 8. Antennal scape as long as the third segment, the third segment about trice as long as broad and each of the following segments about twice as long as broad. Basal four, longitudinal, short, impressed lines on mesonotum not so distinct as in *Pison regale* Smith. The first abdominal tergite comparatively voluminous and the constriction between two basal tergites strong. The first tergite, seen from above, about as broad as long. Apical margin of each segment more distinctly depressed than in *Pison regale* Smith. Venation almost the same as in *Pison regale* Smith.

Length : Head seen from above 2.0 mm., thorax 6.2 mm., first and second abdominal tergites put together 4.8 mm., fore wing 12.0 mm., hind wing 9.5 mm.

Width : Head 4.4 mm., thorax 4.4 mm., first abdominal tergite 3.0 mm., second tergite 4.0 mm.

Habitat : Japan (Honshu).

Holotype : 1♀, 20. vii. 1929, Mt. Kinri, Settsu? Honshu Japan, collected by Mr. K. Iwata, preserved in the Entomological Laboratory, Department of Agriculture, Kyushu Imperial University, Fukuoka.

This new species is closely allied to *Pison regale* Smith from Ussuri-region and China. Through the courtesy of Mr. O. Piel of Shanghai, I have been able to examine Chinese *Pison regale* Smith and to compare these two species. The differences are thus given below.

Pison strandi sp. nov.	*Pison regale* Smith
1. Head, seen in profile, with the ocello-ocular region distinctly visible.	Ocello-ocular region depressed, almost unable to see it.
2. Front more convex.	Front rather feebly convex.
3. Front with an indication of a tubercle just above the insertions of antennae.	Front with a short, longitudinal median carina just above the insertions of antennae.
4. Anterior margin of clypeus more sharply produced.	Anterior margin of clypeus less sharply produced and somewhat rounded.
5. Head, seen in front, slightly wider than long.	Head as wide as long.
6. Propodeum robust, more abruptly truncate posteriorly.	Propodeum more slender, less abruptly truncate posteriorly.
7. Abdomen robust. First tergite, seen from above, about as wide as long at the widest portion.	Abdomen slightly slender. First tergite apparently longer than wide.
8. Femur of hind legs distinctly smaller than the width of the first abdominal tergite.	Femur of hind legs almost as long as the width of the first abdominal tergite.
9. Pubescence pale brown.	Pubescence on head, thorax above and abdomen almost black.
10. Punctures on three basal abdominal tergites as well as sternites stronger and denser.	Punctures on three basal abdominal tergites as well as sternites weaker and and less dense.

3. *Pison iwatai* sp. nov.

♀. In general appearance, this new species is very closely allied to the preceding one as well as to *Pison regale* Smith, but is much more closely related to *Pison strandi* Yasumatsu. A careful comparison of both the species shows the following differences.

1. In *iwatai* the body is much slender than in *strandi*.
2. In *iwatai* the outer margin of the wings is slightly infuscated.
3. In *iwatai* the pubescence on the head and thorax is brownish and denser than in *strandi*.
4. The general appearance of the propodeum and the first abdominal tergite in *iwatai* is almost the same as in *regale*.
5. In *iwatai* the length of the hind femur is as long as the width of the first abdominal tergite.
6. In *iwatai* the first abdominal sternite is somewhat irregularly punctured and has not a median furrow.
7. In *iwatai* the tegulae are brownish black in coloration.

8. In *iwatai* the anterior margin of the clypeus is much more pointed than in *strandi*.
9. In *iwatai* the punctures on the abdominal segments are more minute and denser than in *strandi*.

Length: Head seen from above 2.0 mm., thorax 5.0 mm., first and second abdominal tergites put together 4.0 mm., fore wing 10.0 mm., hind wing 7.6 mm.

Width: Head 4.0 mm., thorax 3.8 mm., first abdominal tergite 2.9 mm., second tergite 3.2 mm.

Habitat: Japan (Honshu).

Holotype: 1♀, vii. 1929, Settsu, Honshu, Japan, collected by Mr. K. Iwata, preserved in the Entomological Laboratory, Department of Agriculture, Kyushu Imperial University, Fukuoka.

Allotype: 1♀, 10. vii. 1919, Mt. Omine, Yamato, Honshu, Japan, collected by Mr. N. Tosawa, preserved in his collection.

4. *Pison tosawai* sp. nov.

♂. Black. Tegulae dark brown. Wings transparent, somewhat infuscated, violaceously reflecting in certain aspect, with nervures brownish black. Colour of wings slightly paler than that of *Pison iwatai* Yasumatsu and the outer margin of wings slightly clouded.

Body covered with grayish pubescence or hairs. Hairs on lower half of head very dense and silver, those on labrum somewhat golden in coloration. Abdominal tergites of the first (except for the base), second and third as well as sternites of basal two segments almost hairless and very shining.

Punctures are comparatively not large. Punctures on front and vertex very dense, while those on the ocellar region very minute and denser. Punctures on the sides and ventral side of thorax slightly coarser than on front, but those on dorsum of thorax very much coarser, those on postscutellum far more minute. Tegulae almost impunctate. Abdomen very shining. Punctures on abdominal tergites very weak and minute, comparatively coarsely scattered, those on the first sternite rather dense and distinct, those on the second sternite rather coarsely scattered. The following sternites almost impunctate.

Head somewhat broader than long in facial aspect. Eyes slightly longer than postgena in profile. Front moderately convex, with an indication of a tubercle just above the insertions of antennae. Postocellar line slightly longer than ocello-ocular line. Distance from the

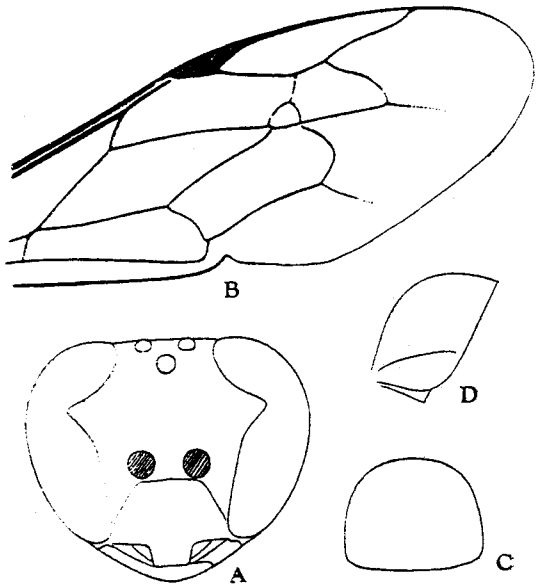

Fig. 2. *Pison tosawai* sp. nov., ♂. A: Head in front. B: Apical half of fore wing. C: First abdominal tergite in dorsal aspect. D: The same above in profile.

anterior ocellus to the posterior ones slightly longer than postocellar line. Impressed line along the posterior margin of each posterior ocellus distinct. Clypeus moderately convex, with the anterior margin strikingly produced and with the apex straightly truncate. Relative length of the segments of antenna: III : IV : V : XIII = 13 : 11 : 10 : 8. The third segment less than trice as long as broad at apex, fourth slightly longer than twice the width of it at apex. Mesonotum slightly convex, twice as broad as long. Parapsidal furrows very feebly recognizable. Posterior half of propodeum abruptly truncate. Propodeum with a median, longitudinal, shallow sulcation which is costate transversely, with some oblique striae. The truncated area of propodeum with a median impression and some feeble oblique striae at the basal half and somewhat distinct transverse (somewhat curved) striae at the apical half. First abdominal segment comparatively voluminous, slightly constricted at apex. First tergite, seen from above, slightly wider than long. Posterior margin of each tergite depressed transversely. Basal two sternites almost flat. The third and fourth sternites each with a trans-

verse, continuous elevation (or sternite depressed both basally and apically). Last sternite with two points.

Length: Head seen from above 1.9 mm., thorax 4.6 mm., first and second abdominal tergites put together 3.6 mm., fore wing 9.5 mm., hind wing 7.2 mm.

Width: Head 3.3 mm., thorax 3.8 mm., first abdominal tergite 2.9 mm., second tergite 3.1 mm.

Habitat: Chichijima Island (Bonin Islands).

Holotype: 1 ♂, 11. v. 1918, Chichijima Island, collected by Dr. A. Nohira, preserved in the collection of Mr. N. Tosawa.

This new species is somewhat allied to the Chinese *Pison insigne* Sickmann. Through the courtesy of Mr. O. Piel of Shanghai, I have been able to examine the Chinese *Pison insigne* Sickmann and to compare these two species. In *insigne* the clypeus is not produced quadrately as in *tosawai*. In *insigne* the mesopleura have tubercles, and the third and the fourth abdominal sternites each with a transverse elevation which is interrupted medially. In *insigne* the second recurrent nervure is received at the third cubital cell, while in *tosawai* it is received just at the apex of the second cubital cell.

5. *Pison punctifrons* Shuckard

1837 *Pison punctifrons* Shuckard, Trans. Entom. Soc. London, vol. 2, p. 77, ♀.
1856 *Pison punctifrons* Smith, Cat. Hymen, Brit. Mus., vol. 4, p. 313.
1858 *Pison suspiciosum* Smith, Journ. Proc. Linn. Soc. Zool., vol. 2, p. 104, ♀.
1869 *Pison fabricator* Smith, Trans. Entom. Soc. London, 1869, p. 297, ♀.
1884 *Pison suspiciosum* Kohl, Verh. zool.-bot. Ges. Wien, 1884, p. 188.
1884 *Pison punctifrons* Kohl, Verh. zool.-bot. Ges. Wien, 1884, p. 188.
1889 *Pison suspiciosum* Cameron, Mem. Manchester Lit. & Phil. Soc., ser. 4, vol. 2, p. 118.
1889 *Pison punctifrons* Cameron, Mem. Manchester Lit. & Phil. Soc., ser. 4, vol. 2, p. 118.
1896 *Pison striolatum* Cameron, Mem. Manchester Lit. & Phil. Soc., vol. 41, p. 82, ♂.
1897 *Pison suspiciosum* Bingham, Fauna Brit. India etc., Hymen., vol. 1, p. 219, ♀ ♂.
1897 *Pison punctifrons* Bingham, Fauna Brit. India etc., Hymen., vol. 1, p. 219, ♀ ♂.
1897 *Pison striolatum* Bingham, Fauna Brit. India etc., Hymen., vol. 1, p. 220, ♂.
1897 *Pison fabricator* Dalla Torre, Cat. Hymen. system. & synonym., Lipsiae, vol. 8, p. 711.
1897 *Pison punctifrons* Dalla Torre, Cat. Hymen. system. & synonym., Lipsiae, vol. 8, p. 712.
1897 *Pison suspiciosum* Dalla Torre, Cat. Hymen. system. & synonym., Lipsiae, vol. 8, p. 713.
1905 *Pison javanus* Cameron, Tijdsch. f. Entom., vol. 48, p. 63, ♂.
1913 *Pison fabricator* Strand, Arch. f. Naturg., Jahrg. 79, 7. Heft, p. 164.
1916 *Pison punctifrons* Turner, Proc. Zool. Soc. London, 1916, p. 625.

1925 *Pison punctifrons* Maidl, Entom. Mitt., Berlin, Bd. 14, p. 390.
1925 *Pison suspiciosus* Sonan, Dobutsugaku Zasshi (Zool. Mag.), Tokyo, vol. 37, no. 440, p. 238.
1927 *Pison fabricator* Sonan, Trans. Nat. Hist. Soc. Formosa, Taihoku, vol. 17, no. 89, p. 136.
1930 *Pison suspiciosum* Chujo, Sylvia, Taihoku, vol. 2, no. 2, p. 52.
1931 *Pison fabricator* Sonan, Trans. Nat. Hist. Soc. Formosa, Taihoku, vol. 21, no. 112, p. 7.
1932 *Pison fabricator* Yano, Icon. Insect. Japon., Hokuryukan, Tokyo, p. 280.
1933 *Pison fabricator* Yasumatsu, Annot. Zool. Japonenses, vol. 14, no. 2, p. 265.
1934 *Pison fabricator* Katayama, Kontyû, Tokyo, vol. 8, nos. 4–6, p. 225.

I have followed the synonymies as published by Mr. R. E. Turner in 1916 for this species.

Habitat: North-west India, Burma, Malay Peninsula, Ceylon, Sumatra, Java, Southern and Eastern China, Pescadores Islands, Formosa, Ishigaki Island, Amami-Oshima Island (new record), Japan (Kyushu, Honshu), Bonin Islands (new record).

Specimens examined: 2 ♂ ♂ (1 ♂, 13. vii. 1933, Naze, Amami-Oshima Island, T. Esaki et K. Yasumatsu leg.) (1 ♂, 16, vii. 1933; Nishinakama, Sumiyô-mura, Amami-Oshima Island, Esaki et Yasumatsu leg.), 1 ♂ (28. v. 1933, Ishigaki Island, C. Senaha leg.) 1 ♂ 1 ♀ (10. viii. 1930, Kagoshima, Kyushu, M. Ueno leg.), 3 ♂ ♂ (26. vii. 1930, Kagoshima, M. Ueno leg.), 1 ♀ (18. vi. 1931, Tomioka-Tororo, Amakusa Islands, Esaki et H. Hori leg.), 1 ♂ (Onomichi, Bingo, Honshu, K. Obayashi leg.), 1 ♀ (31. viii. 1930, Ikeda, near Osaka, Honshu, K. Iwata leg,), 1 ♀ (3. ix. 1932, Kofu, Kai, Honshu, H. Masuda leg.), 1 ♂ (2. v. 1918, Chichijima Island, A. Nohira leg.). The specimens from Onomichi and Chichijima Island are preserved in the collection of Mr. N. Tosawa.

LITERATURE CITED

1. Bingham, C. T. 1897 The Fauna of British India, including Ceylon and Burma. Hymenoptera, vol. 1, p. 217–222.
2. Bridwell, J. C. 1919 Miscellaneous notes on Hymenoptera. With descriprions of new genera and species. Proc. Hawaiian Ent. Soc., vol. 4, no. 1, p. 109–165 (especially p. 123).
3. Cameron, P. 1909 Description of a new species of *Pison* and *Notogonia* from Borneo. Soc. entom., Steglitz, vol. 24, p. 73–74 (especially p. 73).
4. Dalla Torre, C. G. 1897 Catalogus Hymenopterorum hucusque descriptorum systematicus et synonymicus, vol. 8, p. 709–713.
5. Gussakovskij, V. 1933 Verzeichnis der von Herrn Dr. R. Malaise im Ussuri und Kamtschatka gesammelten aculeaten Hymenopteren. Arkiv för Zoologi, Bd. 24 A, no. 10, p. 1–66 (especially p. 9–10).
6. Katayama, H. 1934 Observations on *Pison fabricator* Smith. Kontyû, Tokyo, vol. 8, nos. 4–6, p. 225–227.

7. Maidl, F. 1925 Fauna Sumatrensis (Beitrag Nr. 11), Sphegidae (Hym.). Ent. Mitt., Berlin, Bd. 14, p. 376-390.
8. Radoszkowski, O. 1887 Hyménoptères de Korée. Horae Soc. entom. Ross., vol. 21, p. 428-436 (especially p. 433).
9. Sickmann, F. 1895 Beiträge zur Kenntnis der Hymenopteren Fauna des nördlichen Chinas. Zool. Jahrb., Syst., vol. 8, p. 195-236 (especially p, 210-213).
10. Smith, F. 1852 Descriptions of some new and apparently undescribed species of Hymenopterous Insects from North China, collected by Robert Fortune. Trans. Entom. Soc. London, 1852, p. 34.
11. Smith, F. 1856 Catalogue of Hymenopterous Insects in the collection of the British Museum, pt. 4, p. 313-317.
12. Smith, F. 1858 Catalogue of Hymenopterous Insects collected at Sarawak, Borneo; Mount Ophir, Malacca; and at Singapore by A. R. Wallace. Journ. Proc. Linn. Soc., Zool., vol. 2, p. 104.
13. Smith, F. 1869 Description of new species of the Genus *Pison*; and a synonymic list of those previously described. Trans. Entom. Soc. London, 1869, p. 289-300 (especially p. 297).
14. Sonan, J. 1925 Observations on the habits of some Japanese Sphecid-wasps. Dobutsugaku Zasshi (Zool. Mag.), Tokyo, vol. 37, no. 440, p. 226-240.
15. Sonan, J. 1927 Notes on the specific names and observations on the habits of some Formosan wasps. Trans. Nat. Hist. Soc. Formosa, Taihoku, vol. 17, no. 89, p. 121-138 (especially p. 136).
16. Sonan, J. 1931 Some wasps and bees of Hôkotô (Pescadores) (2). Trans. Nat. Hist. Soc. Formosa, Taihoku, vol. 21, no. 112, p. 6-8 (especially p. 7).
17. Strand, E. 1913 H. Sauters Formosa-Ausbeute. Crabronidae und Scoliidae. II. (Die Gattungen *Ampulex, Dolichurus, Trirogma, Cerceris* und *Pison*, nebst Nachtrag zu *Sceliphron*). Arch. f. Naturg., Jahrg. 79, Abt. A, 7. H., p. 152-165 (especially p. 164).
18. Turner, R. E. 1916 Notes on the wasps of the Genus *Pison*, and some allied genera. Proc. Zool. Soc. London, 1916, p. 591-629.
19. Yano, M. 1932 Iconographia Insectorum Japonicorum (Hymenoptera), Hokuryukan, Tokyo, p. 280.
20. Yasumatsu, K. 1933 Additions to the Hymenopterous fauna of Ishigaki Island. Annot. Zool. Japonenses, vol. 14, no. 2, p. 259-271 (especially p. 265-266).

EXPLANATION OF PLATE 16

A-E: *Pison iwatai* sp. nov., ♂.
F-I : *Pison strandi* sp. nov., ♀.
B, F: Antgrior margin of clypeus.
C, G: First abdominal segment in dorsal aspect.
D, H: The same above in profile.
E, I : First abdominal segment in ventral aspect.