

## Review of Mexican species of the genus *Phytodietus* Gravenhorst (Hymenoptera: Ichneumonidae)

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A key to 11 Mexican species of *Phytodietus* is given. Four new species and one new subspecies are described: *Ph. (Weisia) whartoni* sp. n., *Ph. (Neuchorus) javieri* sp. n., *Ph. (Phytodietus) ninyoi* sp. n., *Ph. (Ph.) ruizi* sp. n., *Ph. (Ph.) yamilethi chiapasi* ssp. n. The subgenus *Weisia* is recorded for the first time from the New World and the subgenus *Phytodietus* s. str., from Mexico.

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The genus *Phytodietus* Gravenhorst, 1829 belongs to the subfamily Tryphoninae. Nearctic species of *Phytodietus* (31 species) were revised by Loan (1981), most part of Neotropical species were reviewed by Gauld et al. (1997), but both revisions do not include Mexican species: *Ph. bellus* Cresson, 1874 (= *Ph. gracilicornis* Cresson, 1874), *Ph. mexicanus* Cresson, 1874, and two further species described from Mexico recently (Kasparyan & Ruíz, 2004). The types of these species were examined by the author; all of them belong to the subgenus *Neuchorus*. In this paper, five new taxa of *Phytodietus* are described, including one species of the subgenus *Weisia* and two species and one new subspecies of the subgenus *Phytodietus* s. str. Subgenus *Weisia* is recorded for the first time from the New World and the subgenus *Phytodietus* s. str., from Mexico (Townes & Townes, 1966; Yu & Horstmann, 1997).

Species of *Phytodietus* are koinobiont ectoparasitoids. Their hosts are small, moderately concealed, naked larvae of different Lepidoptera (mainly Tortricidae and Pyralidae). The females of the genus can be easily recognized by the sagittate ovipositor (Figs 1, 27).

The following abbreviations are used for collections containing types and material on Mexican species of *Phytodietus*: AEI, American Entomological Institute, Gainesville, Florida, USA; ANSP, Philadelphia Academy of Natural Sciences, Philadelphia, USA; BMNH, Natural History Museum, London, U.K.; INBio, Instituto Nacional de Biodiversidad Collection, Santo Domingo, Costa Rica; TAMU, A & M Texas University, College Station, Texas, USA; UAT, Insect Museum of Universidad Autónoma de Tamaulipas,

Cd. Victoria, Mexico; USNM, U.S. National Museum of Natural History, Washington, D.C., USA; ZISP, Zoological Institute, Russian Academy of Sciences, St. Petersburg.

In the "Material", Spanish words are cited like in labels.

### Key to Mexican species of *Phytodietus*

1. Fore wing without areolet; nervellus not intercepted, discoidella lacking (Figs 2, 3). (Subgen. *Weisia*). Habitus as in Fig. 1 ..... 1. ***Phytodietus* (W.) whartoni sp. n.**
- Fore wing with areolet ..... 2
2. First tergite between base and spiracles usually distinctly constricted (Figs 10, 11, 18), in female 1.55-2.5 times as long as wide. Epomia present or absent. Flagellum usually with more than 35 segments. (Subgen. *Neuchorus*) ..... 3
- First tergite between base and spiracles without distinct constriction, in female 1.3-1.6 times as long as wide. Epomia absent or weak. Flagellum (in Mexican species) with 28-36 segments. (Subgen. *Phytodietus* s. str.) ..... 8
3. Thorax (at least laterally) and head predominantly yellow ..... 4
- Thorax predominantly black (or red) with a few yellow or white marks. Head in female black, with white or yellow orbits (orbits interrupted by black on malar space and on upper part of temple, Fig. 23). – Mesopleurum with distinct, moderately fine and dense punctures ..... 7
4. Vertex yellow with blackish transverse band between eyes (Fig. 20). Mesoscutum yellow with 3 blackish longitudinal lines; median black line not interrupted beyond the middle by yellow spot (Fig. 12) ..... 5
- Vertex with black median longitudinal band from ocellar area to occipital carina (Figs 13, 15). Mesoscutum with postmedian central yellow spot (Fig. 9) ..... 6
5. Flagellum black. Three basal flagellomeres not thickened. Hind tarsus black. Hind coxa entirely pale yellow.

- low or with weak blackish dorsoapical spot. Tergite 3 (and all other tergites) with broad apical yellow band. Distal fore wing margin with distinct fuscous band. Some sutures on thorax, base of tergites, and ovipositor sheath black or dark brown . . . . . 4. **Ph. (N.) melanocerus** Kasp. & Ruíz
- Flagellomeres 1 and 2, and base of segment 3 blackish dorsally; segments (3)4-5(6) entirely yellowish; the following segments brownish orange, darker dorsally; apical part of flagellum entirely fuscous. Flagellar segments 1-3 in female at least 1.4 times as wide as segment 6. Hind tarsus yellow. Hind coxa yellowish with large dark stripe on dorsoanterior margin (Figs 21, 22). Tergite 3 entirely brownish (sometimes with weak yellow marks in hind corners); other tergites broadly yellow on hind margin. Fore wing on anterior margin distinctly darkened (brownish yellow) in female, weakly darkened in male. The type of *Ph. mexicanus* darker than other examined Mexican specimens: vertical median line on face, malar space and spot in lower corner of mandibles black; palpi and tegulae blackish; mesopleurum black on prepectus, under subtegular ridge and with black band medially; scutellum with black dorsal line; hind coxa widely black dorsally . . . . . 5. **Ph. (N.) mexicanus** Cresson
6. Hind coxa with a large anterodorsal black spot (Fig. 14). Antenna black with white ring (on flagellomeres about 13-22 in female and 15-30 in male). Epomia short but distinct . . . . . 2. **Ph. (N.) bellus** Cresson
- Hind coxa with two dorsal (anterior and posterior) black lines (Fig. 17). Antenna reddish, without white ring. Epomia absent . . . . . 3. **Ph. (N.) javieri** sp. n.
7. Abdomen entirely red; thorax in female with many white spots. Flagellum with segments 13-17 white. Hind coxa white ventrally and laterally, black apically and dorsally (with dorsal black line); hind femur and tibia uniformly reddish; hind tarsus with segments 2-4 and apex of segment 1 white . . . . . 7. **Ph. (N.) thompsoni** Kasp. & Ruíz
- Abdomen black with white dorsal band on hind margin of tergites 1-4 of female; thorax in female almost entirely black (with yellow marks on scutellum and postscutellum). Head of female black with yellow orbits interrupted on upper part of temple. Thorax of male with many yellow spots; face entirely yellow; propodeum with dorsal yellow spot (Fig. 8). Flagellum blackish brown, without white ring. Hind coxa light red (ventrally yellow in male); hind femur light red; hind tibia in apical 0.35 and hind tarsus entirely blackish . . . . . 6. **Ph. (N.) rufipes pulcherrimus** Cresson
8. Submetapleural carina present . . . . . 9
- Submetapleural carina absent . . . . . 10
9. Clypeus and genae white. Mesoscutum and scutellum entirely red. Mesopleurae red with speculum black and lower hind corner white (Fig. 25). Legs white with a few pale red and pale brownish marks . . . . . 8. **Ph. (Ph.) ninyoi** sp. n.
- Clypeus and genae black. Mesoscutum and scutellum black (both with white anterolateral spots). Mesopleurae red, without black spot on speculum (Fig. 26). Legs predominantly light reddish with hind tibia (except dorsally) and hind tarsus (except basally) blackish . . . . . 9. **Ph. (Ph.) ruizi** sp. n.
10. Tergite 2 of metasoma without distinct lateral transverse impression. Propodeum primarily reddish with a median longitudinal black line (Figs 28, 29). Tergite 1 blackish brown, with posterior margin whitish . . . . . 10. **Ph. (Ph.) sylviae** Gauld
- Tergite 2 of metasoma with distinct lateral transverse impression. Propodeum primarily blackish with variously developed median longitudinal reddish line. Tergite 1 entirely black to blackish brown in hind half, without white on posterior margin (Fig. 27) . . . . . 11
11. Propleurum white. Mesoscutum entirely red. Mesopleurum (including subtegular ridge) red with only speculum black (Fig. 27). Abdomen dark reddish brown with a few black marks (Fig. 27). – Mexico . . . . . 11. **Ph. (Ph.) yamilethi chiapas** ssp. n.
- Propleurum reddish. Mesoscutum red with median black spot. Mesopleurum red with upper part black and subtegular ridge white. Abdomen black. – Costa Rica . . . . . **Ph. (Ph.) yamilethi yamilethi** Gauld

### Subgenus *Weisia* Schmiedeknecht, 1907

The subgenus can be easily distinguished by the lacking areolet in fore wing (Fig. 2) (areolet present in other subgenera); nervellus in hind wing not intercepted and cubitella (= discoidella) reduced (Fig. 3); epomia absent; prepectal carina distinct. This subgenus is recorded from the New World for the first time. It was recorded before from Southern Europe, Africa, Madagascar and the Philippines (Townes, 1969).

#### 1. *Phytodietus* (*Weisia*) *whartoni* sp. n. (Figs 1-7)

*Holotype*. ♀, **Mexico**, Guerrero, 6.2 mi SW Xocipalpa, 5670 ft, 8.VII.1987 (R. Wharton) (TAMU).

*Description*. *Female* (holotype). Fore wing 5.4 mm long. Antenna filiform, with 33 flagellar segments; basal flagellomeres not swollen (Fig. 1). Mandibles strongly tapered to apex, with lower tooth slightly the shorter. Clypeus evenly convex; its lower margin convex, without median notch. Malar space 0.33 times as long as basal width of mandible. Lateral ocellus separated from eye by about 0.7 times its diameter. Occipital carina complete, its lower end joining hyposomal carina on distance from mandible twice more than malar space. Mesosoma polished, with very fine, moderately dense punctures; punctures considerably denser on abdominal tergites and almost absent on pronotum, mesonotum, speculum and upper half of mesopleurum. Epomia and notauli absent. Prepectal carina present; its upper end lying on the level of lower 0.2 of hind margin of pronotum and distant from front margin of mesopleurum. Submetapleural carina complete, uniformly thin. Propodeum without any carinae and without striation, polished, evenly covered with very fine, rather dense, setiferous punctures. Wing venation and hind leg as in Figs 1-3; areolet entirely absent; nervellus slightly postfurcal. First tergite about 1.4 times as long as wide, evenly tapered from apex to base; basal median impression superficial and not surround-



**Figs 1-7.** *Phytodietus (Weisia) whartoni* sp. n. **1**, female, colour pattern; **2**, fore wing; **3**, hind wing; **4**, hind tarsal claw; **5**, mesonotum, dorsal view; **6**, propodeum, dorsal view; **7**, first tergite, dorsal view.

ed by carinae; dorsal and dorsolateral carinae absent. Second tergite about 0.6 times as long as its posterior width. Ovipositor sheath about 1.05 times as long as hind tibia.

Body black with extensive yellowish white pattern (Figs 1, 5-7). Face with median longitudinal black line; clypeal suture blackish; frons, vertex and temples all black, except for orbits; occiput entirely black. Mesosternum yellowish with lateral black marks. Fore and middle coxae and trochanters white; base of middle coxa and trochanters with small blackish marks; femora, tibiae and tarsi rufous, slightly darker to apex of tarsi. Hind leg with colour pattern as in Fig. 1; hind coxa and trochanters yellowish white, coxa with large black posterior spot in basal half; hind femur reddish with yellow mark at extreme apex; hind tibia brownish in basal 0.65 and blackish in apical 0.35; spurs brownish; hind tarsus completely blackish. Pterostigma blackish brown. Ovipositor sheath black with reddish apex (0.1).

*Male unknown.*

*Comparison.* Chromatically, *Ph. whartoni* closely resembles the European *Ph. bayeri* Gregor, except that temples, mesopleuron, and propodeum are predominantly white in *Ph. whartoni* and mainly black in *Ph. bayeri*; the first tergite in *Ph. bayeri* is longer, almost twice as long as wide.

*Etymology.* This species is named after Robert A. Wharton, well known hymenopterologist, collector of the holotype.

Subgenus **Neuchorus** Uchida, 1931

## 2. *Phytodietus (Neuchorus) bellus* Cresson (Figs 13, 14)

Cresson, 1874: 408, ♂ (*Lampronota bella*; type: ♂, Mexico, Cordoba); Cameron, 1886: 277 (*Phytodietus*). – *gracilicornis* Cresson, 1874: 411, ♀ (type: ♀, Mexico, Orizaba).

**Material examined.** **Mexico:** Veracruz: types, ♀ ♂ (ANSP); *Tamaulipas*: 2 ♀, 3 ♂, 25 km SSW Cd. Victoria, El Madronio, 1200-1400 m, *Quercus* forest, 24.XI and 9.XII.1984, 26.V.1985 (E. & J. Ruíz z C.); 1 ♀, 22 km SSW Cd. Victoria, Altas Cumbres, 1000 m, *Quercus* forest, 28.IX.1988 (R. Thompson F.); 1 ♀, Gomez Farias, Canindo, 1400 m, Malaise tr., 28-30.VII.1993 (J.B. Woolley); 1 ♀, San Jose, 15 km W Gomez Farias, 1400 m, 14.XI.1998 (D. Kasparyan). All specimens, except the types, are at UAT and ZISP (2 ♀).

**Diagnosis.** The species can be easily recognized among other yellow species by the broad white ring on flagellum in female and male, coloration of head, hind coxa (Figs 13, 14) and mesoscutum (similar to that in *Ph. javieri*, Fig. 9).

### 3. *Phytodietus (Neuchorus) javieri* sp. n. (Figs 9, 15-19)

**Holotype.** ♀, **Mexico**, *Tamaulipas*, El Madronio, 28 km SSW Cd. Victoria, 1400 m, *Quercus* forest, 28.IV.1985 (Javier Ruíz z C.) (UAT).

**Description.** **Female** (holotypus). Fore wing 10.5 mm long. Antenna with 42 flagellar segments; basal flagellomeres not swollen. Mandibles basally broad, moderately tapered to apex, with lower tooth slightly the shorter. Clypeus convex, with impression along lower margin; lower margin sharp and with weak median concavity. Malar space about 0.55 times as long as basal width of mandible. Lateral ocellus separated from eye by its diameter; ocelli situated on front of head rather than on top. Occipital carina complete, its lower end joining hypostomal carina. Head (except for some coarse punctures on clypeus) and mesosoma mat, with fine dense setiferous punctures; clypeus, pronotum and mesopleurum a little more shiny; speculum with distinct, moderately dense punctures and with short hairs. Punctures on metapleurum superficial and partly obscured by fine granulation. Epomia absent. Notauli weakly impressed. Prepectal carina distinct. Submetapleurale carina complete. Propodeum with weak sublateral crests (remains of apical transverse carina), with rather short erect hairs, and with irregular fine transverse striation on its apical 0.6. Pecten of hind tarsal claws with 8 subequal teeth and as high as apical tooth of claw. Tergites smooth, evenly covered with very dense and fine setiferous punctures. First tergite (Fig. 18) about twice as long as wide; its dorsal and dorsolateral carinae distinct; dorsal carinae short, slightly not extending to level of spiracles; glymmae very deep, their inner wall translucent. Second tergite about 0.75 times as long as broad posteriorly. Ovipositor sheath 1.33 times as long as hind tibia; pubescence of sheath rather short and moderately coarse.

Body predominantly yellow and brownish yellow with a few black markings (mainly on mesonotum and at base of abdominal segments). Head

yellow with black markings on frons and posteriorly (Fig. 15). Antenna reddish brown with apical 0.3 of flagellum dark brown dorsally, and with scape and pedicel yellow ventrally; palpi reddish brown. Mesosoma yellow; pronotum and mesonotum with black pattern as in Figs 9, 16; mesopleurum with black line on anterior margin of prepectus and with black band under subtegular ridge; metanotum with black line before its yellow hind margin; black line present between lower and upper parts of metapleurum and on basal groove between metanotum and propodeum. There are rufous spots on metapleurum before propodeal spiracles and at extreme base of propodeum dorsally. First abdominal segment rufous with subbasal black spot (Fig. 18); segments 2-6 black basally and reddish yellow in apical half; segment 7 darkened dorsally to hind margin; basal black band on segment 8 interrupted dorsally with yellow (Fig. 19). Legs yellow with femora pale reddish; fore and middle femora yellowish anteriorly; hind coxa with two dorsal black stripes (Fig. 17). Wings light yellowish; pterostigma yellowish; its margins, costa and subcosta pale rufous.

**Male** unknown.

**Comparison.** *Ph. javieri* differs from other Mexican species with predominantly yellow head and lateral sides of thorax (*Ph. gracilicornis* Cresson, *Ph. mexicanus* Cresson, *Ph. melanocerus* Kasp. & Ruíz z) in the coloration of flagellum (more or less uniformly reddish brown), vertex, mesonotum and hind coxa (Figs 9, 15-17) (except that in *Ph. gracilicornis* coloration of mesonotum is similar).

**Etymology.** This species is named after Javier Ruíz z Cancino, who has collected the holotype.

### 4. *Phytodietus (Neuchorus) melanocerus*

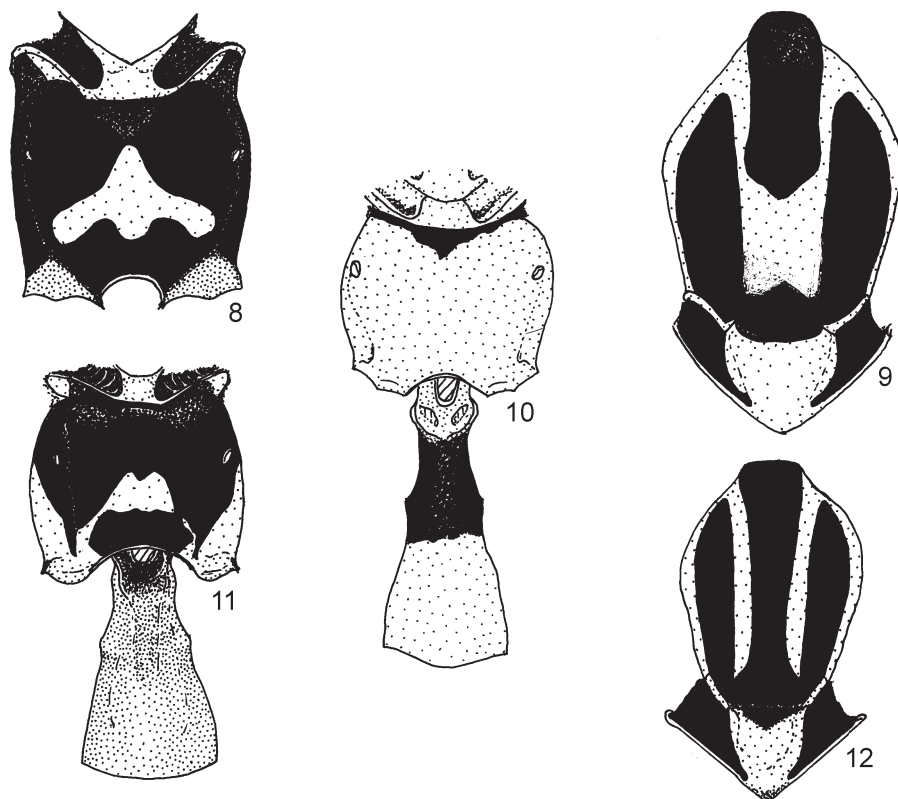
Kasparyan & Ruíz z  
(Figs 10, 20)

Kasparyan & Ruíz z, 2004: 73, ♀ ♂ (holotype: ♀, Mexico, Morelos, Rt 142, km 49.5, btw El Vigia & San Filipe Neri, 12.VIII.1989, A.L. Norrbom; USNM).

**Material examined.** **Mexico.** **Morelos** (holotype and ♂, paratype); *Tamaulipas*: 1 ♀, Cd. Victoria, canyon Novillo, 5.V.1985 (A. del Valle); 2 ♀ 2 ♂, km 68, Cd. Victoria-Soto la Marina, Villa Casas, 11.V.1985, 3.I. and 14.IV.1987 (E. and J. Ruíz z C., A. del Valle); 3 ♀, 2 ♂, Llera, 44 km S Cd. Victoria, matorral, Malaise tr., 28.X-18.XI.2000 (D. Kasparyan); 6 ♀, Gomez Farias, Los Cedros, 340 m, Malaise tr., 7.I-20.II.1999 (S. Hernández A. & C. Covarrubias D.); 7 ♀, Gomez Farias, Alta Cimas, 940 m, Malaise tr., 27.III-29.V.1999 (S. Hernández A.); 1 ♀, Ocampo, 21.XI.1991 (E. Ruíz z C.). All specimens, except the types, are at UAT and ZISP (2 ♀).

**Diagnosis.** *Ph. melanocerus* differs from other yellow Neotropical species with predominantly yellow head and lateral sides of thorax (*Ph. gra-*





**Figs 8-12.** *Phytodietus* (*Neuchorus*), ♀ (except for 8, ♂). **8**, *Ph. rufipes pulcherrimus* Cresson, propodeum, dorsal view; **9**, *Ph. javieri* sp. n., mesonotum, dorsal view; **10**, *Ph. melanocerus* Kasp. & Ruíz, propodeum and first tergite, dorsal view; **11**, *Ph. thompsoni* Kasp. & Ruíz, propodeum and first tergite, dorsal view; **12**, *Ph. mexicanus* Cresson, mesonotum, dorsal view.

*cilicornis*, *Ph. mexicanus*, *Ph. javieri*, *Ph. lindus* Gauld, *Ph. maximoi* Gauld) in the completely black flagellum and distinct fuscous band at the distal wing margin. In the holotype and in paratypes from Morelos, the hind trochanters and base and apex of hind femur are black; in other specimens from Tamaulipas, these parts of hind legs are yellowish red.

#### 5. *Phytodietus* (*Neuchorus*) *mexicanus* Cresson (Figs 12, 21, 22)

Cresson, 1874: 412, ♀ (type: ♀, Mexico, Cordoba).

**Material examined.** **Mexico:** Veracruz: type, ♀ (ANSP); Tamaulipas: 2 ♀, 3 ♂, El Madronio, 25 km SSW Cd. Victoria, 1200-1400 m, *Quercus* forest, 25.V and 10.VII.1985 (E. & J. Ruíz C.); 2 specimens, Gomez Farias, C. Libertad, bosque encino-pino, 800-950 m, 19.I. and 12.III.1988 (J. de Leon); 1 ♀, Gomez Farias, Canindo, 1400 m, Malaise tr., 21-22.VII.1994 (J.B. Woolley). All specimens, except the type, are at UAT and ZISP (1 ♀).

**Diagnosis.** *Ph. mexicanus* can be easily distinguished from other Mexican species with predominantly yellowish body by its completely brownish tergite 3 (sometimes with weak yellow spots in hind corners) and distinctly thickened 3 basal flagellar segments (but not so strongly as in *Ph. lindus* Gauld from Costa Rica).

**Distribution.** Mexico (Veracruz, Tamaulipas).

#### 6. *Phytodietus* (*Neuchorus*) *rufipes pulcherrimus* (Cresson) (Fig. 8)

Cresson, 1868: 101, ♂ [*Mesoleptus pulcherrimus*; type: ♂, USA (ANSP)]; Townes, 1969: 147 [*Phytodietus* (*Neuchorus*) *rufipes pulcherrimus*]; Loan, 1981: 338 (key, description, distribution, synn., figs).

**Material examined.** **USA** (at ZISP): New Jersey: 1 ♀, Moorestown, 30.VI.1939 (H. & M. Townes); Michigan: 1 ♀, 1 ♂, Ann Arbor, 30.VII.1957, 6.VIII.1967 (H. & M. Townes); 1 ♂, Crystal Falls, 3.VII.1969 (H. & M. Townes). **Mexico** (at UAT), Coahuila, municip. Artega: 1 ♀, 1 ♂, El Milagro, Rancho Rincon de los Pinos,

huerta de manzano, 2100 m, 8.VII.2000 (S. Hernández A. & C. Covarrubias D.); 2 ♂, El Tunal, huerta de manzano, 2500 m, 8.VII.2000 (C. Covarrubias D.).

**Diagnosis.** *Ph. rufipes pulcherrimus* resembles the Costarican *Ph. penai* Gauld in the predominantly black body, but differs in the polished body without granulation, distinct epomia, uniformly reddish hind coxae and almost entirely black thorax of female (only tegulae, apex of mesepimeron and spots on scutellum and postscutellum are yellow).

## 7. *Phytodietus* (*Neuchorus*) *thompsoni*

Kasparyan & Ruíz

(Figs 11, 23, 24)

Kasparyan & Ruíz, 2004: 74, ♀ ♂ (holotype: ♀, Mexico, Tamaulipas, km 7, Miquihuana – El Tanque, 3.XI.1988, R. Thompson F.; UAT).

**Material examined.** **Mexico:** Tamaulipas: holotype, ♀; Nuevo León: 1 ♂, San Pedro, Iturbide, 32 km W Linares, 26.X.1962 (H. & M. Townes) (AEI).

**Diagnosis.** *Ph. thompsoni* can be easily distinguished by the brownish red coloration of metasoma. It differs from the Nearctic *Ph. rutilus* Krebs with similar colour of metasoma in the black thorax with white spots (black with red in *Ph. rutilus*).

Subgenus ***Phytodietus*** s. str.

## 8. *Phytodietus* (*Phytodietus*) *ninyoi* sp. n.

(Fig. 25)

**Holotype.** ♀, **Mexico**, Tamaulipas, Gomez Farias, San Jose, 1500 m, 12.V.1995 (S. Niño & H. Hernández Mtz.) (UAT).

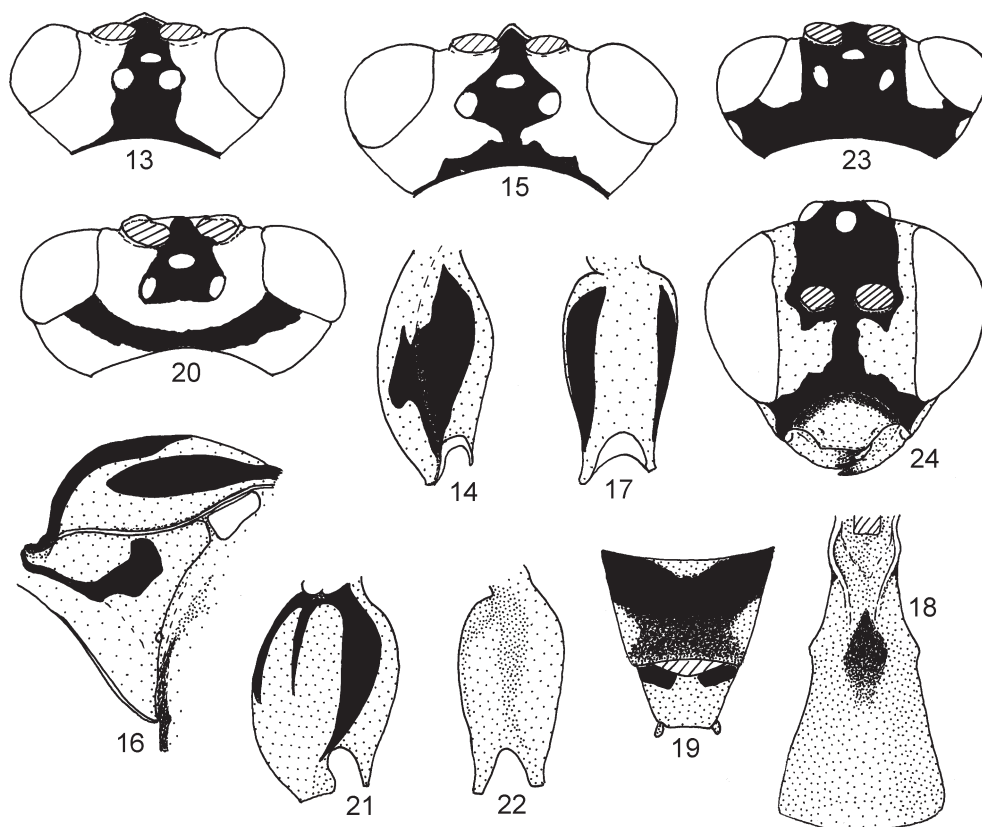
**Paratypes.** **Mexico** (UAT and 1 ♀ in ZISP), Tamaulipas: 4 ♀, same data as holotype; 3 ♂, Ocampo, Joya Manantiales, 12-13.V.1995 (S. Niño & H. Hernández Mtz.).

**Description.** **Female** (holotype). Fore wing about 7.0 mm long. Antenna filiform, with 36 flagellar segments; basal flagellomeres not swollen. Clypeus weakly convex on basal 0.4, its apical 0.6 flat; lower margin of clypeus sharp, in median 0.6 truncate and with superficial median notch. Malar space 0.35 times as long as basal width of mandible. Mandibles basally broad, moderately tapered to apex, with lower tooth smaller and slightly the shorter. Face finely granulate, with distinct, moderately fine and moderately dense punctures. Frons almost smooth, with very fine punctures and with moderately dense short hairs. Lateral ocellus separated from eye by 0.8 its diameter. Occipital carina complete, its lower end joining hypostomal carina rather close to mandible (on distance from mandible about 0.35 times as long as basal width of mandible). Mesosoma smooth, with very fine dense punctures, more or less evenly covered with dense

short hairs; metapleurum a little smoother and its punctures finer. Epomia absent. Notauli very superficial, absent anteriorly. Prepectal carina distinct, ending dorsally at the level of lower 0.25 of hind margin of pronotum and far from anterior margin of mesopleurum. Submetapleural carina strong and complete. Propodeum subpolished, without any carinae, without transverse wrinkles, and with moderately short hairs dorsally. Abdominal tergites smooth, more or less evenly covered with rather dense short hairs. First tergite 1.2 times as long as wide; its median dorsal carina strong but short and bordering the basal pit only laterally; dorsolateral carina distinct and slightly widened before spiracle; profile of first tergite in basal third at least 0.33 times as high as length of tergite. Second tergite about 0.6 times as long as posteriorly broad. Ovipositor sheath about 0.85 times as long as hind tibia; pubescence of sheath coarse but not especially long.

Head black with clypeus, palpi, mandibles, cheeks (lower part of temple below the eye), orbits on frons, and a pair of large spots on vertex above the eye white. Antenna brownish; pedicel white ventrally; scape with weak ventral pale mark. Thorax predominantly red with black and white (or light yellow) pattern as in Fig. 25; propleurum entirely, apex of scutellum and postscutellum whitish; mesoscutum entirely red with a pair of unclear anterolateral reddish yellow spots. Abdominal tergites brown with reddish tinge; hind margin of tergites 1-5 with white band, which is broadened on hind corners, on tergite 5 this band is interrupted medially. Tergites 6-8 blackish brown dorsally. Epipleurae of all tergites white with large elongate brown median spot on tergite 2 and with small one on tergite 3. Sternites whitish with a lateral brown spot on each sternite. Legs predominantly white; fore and middle femora pale rufous in apical 0.6; hind coxa pale rufous with large dorsal white spot (Fig. 25); hind femur slightly pale brownish anteriorly; middle and hind tibiae with blackish mark on apical margin, and hind tibia in basal 0.2 with brownish stripe anteriorly; hind spurs brownish; last segment of fore tarsus and two last segments of middle and hind tarsi brownish; hind tarsus with segments 1-3 infuscate at extreme apex. Pterostigma yellowish.

**Male.** Structurally and in main characters of coloration rather similar to female; differs in the following: abdomen slender, first tergite about 1.8 times as long as wide; lower 0.4 of temple and face entirely yellow; pronotum dorsolaterally black, except for hind corners; mesoscutum red with median black spot on anterior slope; mesopleurum in lower half and mesosternum entirely pale yellow; propodeum and first tergite entirely black; all other tergites black with white



**Figs 13-24.** *Phytodietus* (*Neuchorus*), ♀ (except for 14: ♂, type of *Ph. bellus*). **13, 14,** *Ph. bellus* Cresson; **15-19,** *Ph. javieri* sp. n.; **20,** *Ph. melanocerus* Kasp. & Ruíz z.; **21, 22,** *Ph. mexicanus* Cresson; **23, 24,** *Ph. thompsoni* Kasp. & Ruíz z. 13, 15, 20, 23, head, dorsal view; 14, 17, 21, 22, hind coxa, dorsal and dorsolateral view; 16, pronotum and mesoscutum, lateral view; 18, tergite 1, dorsal view; 19, tergites 7 and 8, dorsal view; 24, head, anterior view

band on hind margin. Hind coxa white with dorsolateral pale brown mark.

**Comparison.** *Ph. ninyoi* resembles the Nearctic *Ph. rubellus* Loan in having red mesothorax and metapleurum and predominantly white legs; *Ph. ninyoi* differs from *Ph. rubellus* in the white cheeks, tricoloured pronotum, and lack of notauli.

**Etymology.** This species is named after Dr. Santiago Niño, entomologist of UAT, collector of the type material.

#### 9. *Phytodietus* (*Phytodietus*) *ruizi* sp. n. (Fig. 26)

**Holotype.** ♀, **Mexico**, *Tamaulipas*, 25 km SSW Cd. Victoria, El Madronio, 1200-1400 m, *Quercus* forest, 16.XI.1985 (E. Ruíz z C.) (UAT).

**Paratypes** (UAT and 1 ♀ in ZISP), same locality as in holotype: 3 ♀, 6.V. and 11-24.XI.1984 (E. & J. Ruíz z C.); 2 ♀, 31.III.2001 and 3.IV.2002 (J. Luhman & J. Coronado B.).

**Description.** *Female* (holotype). Fore wing about 8.0 mm long. Antenna filiform, with 33 flagellar segments; basal flagellomeres not swollen. Clypeus weakly convex in basal half, its apical half flat and with median subapical superficial pit; lower margin of clypeus sharp, in median 0.6 truncate. Malar space half as long as basal width of mandible. Mandibles basally broad, moderately tapered to apex, with lower tooth slightly the shorter. Face finely granulate, on central convexity with moderately fine and moderately dense punctures; lateral parts of face and frons almost smooth, with very fine inconspicuous punctures and with moderately dense short hairs. Lateral ocellus separated from eye by 0.9 its diameter. Occipital carina complete, its lower end joining hypostomal carina on distance from mandible about 0.6 times as long as basal width of mandible. Mesosoma smooth, covered with inconspicuous, very fine, dense setiferous punctures.

tures, hairs more or less evenly distributed, fine and short; metapleurum a little smoother and its punctures finer. Epomia absent. Notauli in anterior 0.3 of mesoscutum rather sharp. Prepectal carina distinct, ending dorsally at the level of lower 0.25 of hind margin of pronotum and far from anterior margin of mesopleurum. Submetapleural carina strong anteriorly, becoming weaker in posterior half. Propodeum subpolished, without any carinae, without transverse wrinkles, and covered with moderately short hairs dorsally, except for small median apical area. Abdominal tergites smooth, more or less evenly covered with rather dense short hairs; setiferous punctures on tergite 2 and basal half of tergite 3 discernible, beyond middle of tergite 3 punctures very fine and superficial. First tergite 1.3 times as long as wide; its median dorsal carina strong but short and bordering basal pit only laterally; dorsolateral carina more or less distinct only before spiracle; profile of first tergite in basal third about 0.3 times as high as length of tergite. Second tergite 0.66 times as long as posteriorly broad. Ovipositor sheath about 0.95 times as long as hind tibia; pubescence of sheath coarse but not especially long.

Head (including clypeus) black with palpi, mandibles, very small spot just beyond mandible, a spot on vertex above top of eye whitish yellow. Antenna brownish; pedicel and first flagellar segment white ventrally. Thorax predominantly black with red mesopleurum, mesosternum and metapleurum, and with some white (or light yellow) marks (Fig. 26); propleurum entirely black; two basolateral spots of scutellum, its apex and apex of postscutellum, hind edges of mesonotum and metanotum white. Abdominal tergites black; median apical mark on tergite 1 and posterior band on tergites 2-5 white; this band broadened on hind corners, on tergite 2 shortly interrupted sublaterally. Tergites 6-7 only in posterior corners white; tergite 8 entirely black. Epipleurae of all tergites white with large elongate brown median spot on tergites 2 and 3. Sternites brownish basally, pale in posterior 0.3-0.4. Legs predominantly light reddish; fore coxa, all trochanters (except for reddish brown base of hind trochanter I; Fig. 26), extreme base and extreme apex of hind femur white (or whitish yellow), hind femur with light subapical infuscation; hind tibia white, with basal 0.2 laterally, entire ventral surface and apical 0.1 blackish; hind spurs blackish; hind tarsus black with dorsal 0.4 of basitarsus whitish. Pterostigma yellowish.

*Male* unknown.

*Variability.* Fore wing 7-8 mm, flagellum with 32-33 segments. In some paratypes, mesopleurum almost entirely red (paler than in holotype; Fig. 26), tergites 6 and 8 with discernible thin

white apical band, hind tarsus with segments 1 and 2 predominantly whitish and segments 3-5 light brownish.

*Comparison.* *Ph. ruizi* resembles the Nearctic *Ph. criddleanae* Loan in the red mesosternum and similar coloration of legs; *Ph. ruizi* differs from *Ph. criddleanae* in the entirely black clypeus, almost entirely red mesopleurum, and longer malar space.

*Etymology.* The new species is named after Dr. Enrique Ruíz Cancino.

#### 10. *Phytodietus (Phytodietus) sylviae*

Gauld, 1997

(Figs 28, 29)

Gauld in Gauld et al., 1997: 352, 364, ♀ ♂ (holotype: ♀, Costa Rica, San Jose Prov., 26 km N of San Isidro de General, 2100 m, II-V.1991 (Hanson & Gauld) (IN-Bio); one of the paratypes, ♀, **Mexico**, Orizaba, XII.1857 (BMNH)].

*Material examined.* **Honduras:** 1 ♀, Olancho, La Murilla National Park, 1480 m, 15°5'49"N, 86°44'17"W (D. Yanega) (Mus. Riverside).

*Diagnosis.* *Ph. sylviae* belongs to the *Ph. sylviae* species-group (Gauld et al., 1997), which is characterised by the complete absence of the sub-metapleural and prepectal carinae; it differs from *Ph. yamilethi* of this species-group in the lack of distinct lateral transverse impression on tergite 2 of metasoma. Female with fore wing 5.5 to 6.5 mm; ovipositor sheath with long, coarse, close pubescence proximally. Head black with lower margin of clypeus, palpi and mandibles white. Mesosoma mostly reddish (Fig. 28) with black shiny patches on centre of pronotum, centre of mesoscutum, upper hind corner of mesopleurum, axillae, lower anterior part of metapleurum and along base of propodeum; propodeum dorsally with a longitudinal black stripe, which is broadened to its hind margin (Fig. 29). Hind and lower corners of pronotum, tegula, subtegular ridge, hind margin of scutellum and postscutellum, lower posterior corner of mesopleurum and mesepimeron white. In female from Mexico, mesoscutum with anterolateral yellow spot. Metasoma blackish brown, with a slight metallic sheen and a white band along hind margin of each tergite and sternite. Legs white; hind coxa with dorso-posterior brownish mark, distal tarsal segments slightly infuscate. Pterostigma yellowish brown.

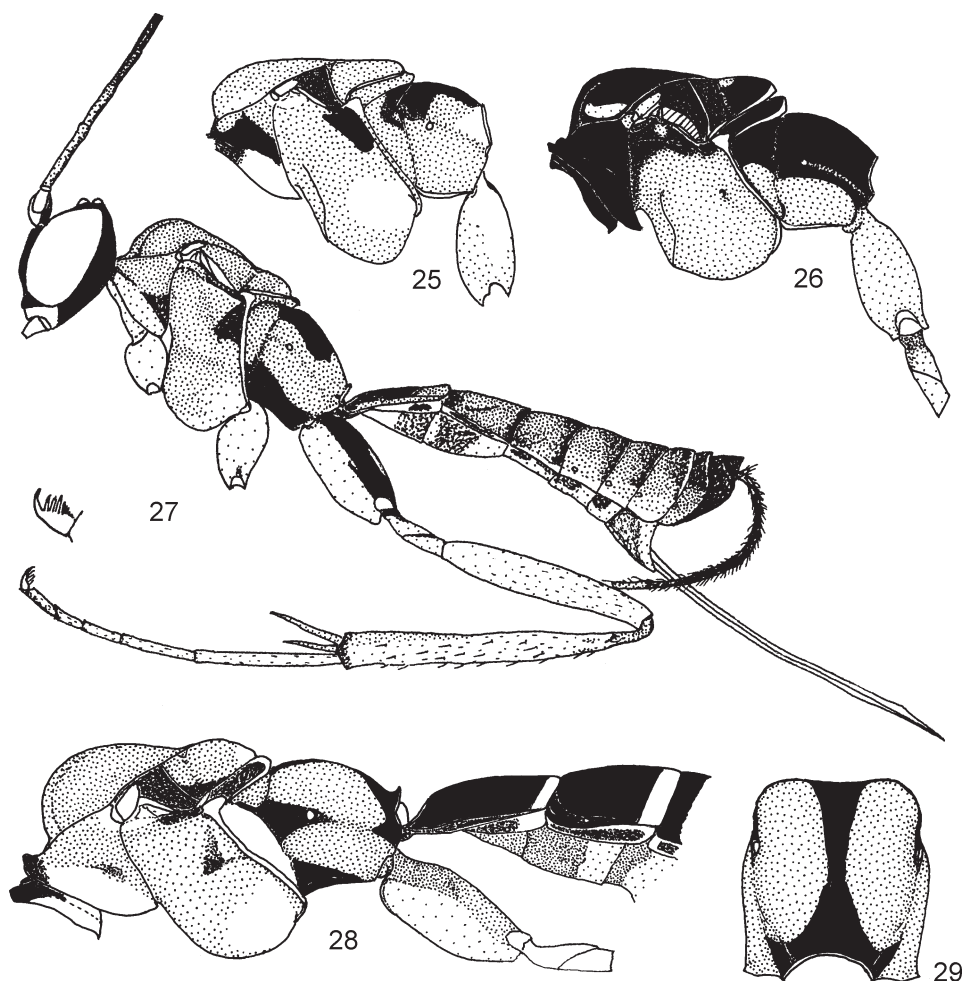
*Distribution.* Mexico (Veracruz), Honduras, Costa Rica.

#### 11. *Phytodietus (Phytodietus) yamilethi chiapas* ssp. n.

(Fig. 27)

*Holotype.* ♀, **Mexico**, Chiapas, Municipio San Cristobal, Reserva Huitepec, 16°46'06"N, 92°41'04"W, 8000





**Figs 25-29.** *Phytodietus* (*Phytodietus*), ♀. 25, *Ph. ninyoi* sp. n.; 26, *Ph. ruizi* sp. n.; 27, *Ph. yamilethi chiapas* ssp. n.; 28, 29, *Ph. sylviae* Gauld. 25, 26, thorax (lateral view) with hind coxa; 27, female, colour pattern; 28, thorax (lateral view) with base of abdomen and hind leg; 29, propodeum, dorsal view.

ft, Malaise trap 97/072, 2-14.VIII.1997 (Woolley, Gonzalez & Galdamez) (TAMU).

**Description.** *Female* (holotype). Fore wing 5.5 mm long. Antenna with 28 flagellar segments; two basal flagellomeres combined 1.07 times as long as maximum diameter of eye. Malar space about 0.4 times as long as basal width of mandible. Mandible slightly convex before base, more or less evenly tapered to apex, with lower tooth the shorter. Clypeus convex on basal 0.35, apically flat and without distinct median notch. Lateral ocellus separated from eye by about 1.1 its diameters. Occipital carina present only dorsally, with median angulation anteriorly. Face with distinct granulation (especially distinct under an-

tennal sockets) and with rather sparse, moderately fine setiferous punctures; frons polished, with very fine punctures. Mesosoma smooth, with fine inconspicuous punctures. Epomia absent. Notauli strongly impressed anteriorly. Prepectal carina absent. Propodeum smooth, with a pair of postmedian superficial pits. First tergite 1.33 times as long as wide posteriorly; its dorsal carinae short but sharp and strongly approaching just beyond the basal hole.

Antenna dark brown with scape, pedicel and first flagellar segment yellowish ventrally. Head black with clypeus, cheeks and frontal orbits (from level of lower margin of anterior ocellus to hind margin of posterior ocellus) whitish.

Mesosoma red with black and whitish yellow marks as in Fig. 27. Abdomen dark reddish brown with black and white marks as in Fig. 27.

*Male* unknown.

*Comparison.* The new subspecies differs from the nominotypical one mainly in the coloration (Fig. 27): propleurum completely and anterolateral third of pronotum white; mesoscutum entirely and upper part of mesopleurum (except for black speculum) red (subtegular ridge without white mark); lower 0.4 of metapleurum black, base of hind trochanter I black; base of hind tibia fuscous, tergites brown with reddish tinge and blackish marks; epipleurae of tergites 4-7 whitish.

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